



US EPA RECORDS CENTER REGION 5



467121

Mr. Keith Krawczyk
MDEQ-RRD-Superfund
Constitution Hall – 3rd Floor South
525 West Allegan Street
P.O. Box 30426
Lansing, Michigan 48909-7926

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.671.9450
www.arcadis-us.com

ENVIRONMENT

Subject:
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit
Landfill Gas Monitoring Program – Quarterly Report (2013 Quarter 2)

Date:
July 18, 2013

Dear Mr. Krawczyk:

On behalf of Georgia-Pacific LLC (Georgia-Pacific), this letter presents results from the 2013 second quarter post-closure landfill gas monitoring event conducted on May 31, 2013 at the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site King Highway Landfill Operable Unit 3 (KHL OU) located in Kalamazoo, Michigan. The May 2013 monitoring event reflects continued quarterly monitoring activities performed consistent with the *FINAL Operations and Maintenance Plan* (O&M Plan; ARCADIS 2013a), on behalf of Georgia-Pacific. Consistent with previous landfill gas monitoring events, representatives from the Michigan Department of Environmental Quality (MDEQ) were present to observe the monitoring activities, which were performed by ARCADIS using a portable gas analyzer.

Contact:
Patrick McGuire

Phone:
315.671.9233

Email:
pat.mcguire@arcadis-us.com

Our ref:
B0064583.0004.00907

On May 22 and 23, 2013, prior to performing the May 2013 monitoring event, four permanent landfill gas monitoring probes (GW-18 through GW-21) were installed by Terra Contracting Services, LLC (Terra) along the western boundary of the KHL at the locations and depths proposed in the Investigation Plan for Off-Site Landfill Gas Migration at the KHL (ARCADIS 2013b). The permanent gas monitoring probes were installed to investigate the potential migration of landfill gas along the western landfill boundary in the vicinity of gas probes GW-13 and GW-14. Quarterly monitoring of gas probes GW-13 and GW-14 has been performed since the probes were installed in 2011, and has indicated that landfill gas may be present at the western landfill boundary above the lower explosive limit (LEL). Prior to installation of the new permanent probes, temporary boreholes had been installed and monitored along the western property boundary of the KHL. While the gas collection trenches have been used successfully to control landfill gas along the western and southern boundaries, the gas collection trench was not extended the full length of the western landfill boundary due to presence of a 72-inch diameter City of Kalamazoo sanitary sewer, which interferes with extending the trench in the north and south directions.

An access agreement with the City of Kalamazoo was in place for the installation and monitoring of permanent perimeter gas probe GW-20. In addition, another permanent landfill gas monitoring probe (GW-15A) was installed approximately 40 feet to the north of existing gas probe GW-15 to evaluate the potential migration of methane along the City of Kalamazoo underground utilities (water and sanitary sewer lines). The locations of the five additional landfill gas monitoring probes are shown on Figure 1, as surveyed by Terra. The soil boring and construction logs for the newly installed gas probes and photo log of the installation of gas probe GW-21 are provided in Attachment A.

In addition, Terra performed hydro-excavation in the area of the sanitary sewer line near the location of new gas probes GW-18, GW-19, and GW-21 to determine the location of the sanitary sewer pipe. During hydro-excavation of the location of new gas probe GW-21, the top of the sanitary sewer line was observed at approximately 6.3 feet below ground surface (bgs) and groundwater was observed at approximately 5.5 feet bgs, as identified on the soil boring log for gas probe GW-21 and photo log provided in Attachment A. The material surrounding the sanitary sewer line was determined to be sand with trace amounts of silt.

Monitoring results for the May 2013 event are presented in Table 1 and Figure 1; all monitoring results recorded to date are presented in Table 2 and Figure 2 (methane only). In addition, water level measurements collected at a limited number permanent gas probes are also included in Table 1. The water surface elevation was below the elevation of the top of the screen for each gas probe, where water level measurements were collected¹ (Table 1). As such, none of the gas probe screens were observed to be "water logged".

Monitoring of the 11 permanent landfill gas monitoring probes located within the property boundary (GW-1 through GW-4, GW-11 through GW-14, and GW-18, GW-19, and GW-21) resulted in methane detections at concentrations above the LEL in eight of the 11 gas probes (i.e., GW-1 through GW-4, GW-13, GW-14, GW-18, and GW-19). Monitoring of the 11 permanent landfill gas monitoring probes located outside the landfill property boundary (GW-5 through GW-10, GW-15 through GW-17, and GW-20) resulted in no detections of methane at concentrations above LEL in any of the 11 gas probes. The storage shed located in the southwest corner of the KHL was monitored, which resulted in no detection of methane.

In addition, as requested by MDEQ in a letter dated April 23, 2013 (MDEQ 2013), landfill gas concentrations were measured in the 72-inch diameter sanitary sewer line

¹The caps on gas probes GW-5, GW-7, GW-9, GW-10, and GW-11 could not be removed during the monitoring event to collect water level measurements within the gas probes.

via manholes connected to the sewer line. Monitoring was conducted in four manholes located at the northwest corner (manholes #11, #12, and #14) and southwest corner (manhole #15) of the KHL (Figure 1). Monitoring of the manholes did not resulted in detections of methane at concentrations above the LEL in any of the four manholes.

As indicated on Table 1 and Figure 1, the May 2013 monitoring results for the new permanent gas probes verified the following:

1. GW-15A – located on the landfill side (north) of the underground utilities – verified that landfill gas is not migrating south towards the City of Kalamazoo underground utilities located south of the landfill property boundary.
2. GW- 21 – located west of GW-14 in the southwest corner of the landfill, just south of the storm/pore water basin – verified that landfill gas detected at GW-14 is not migrating west beyond the western property boundary.
3. GW-20 – located at the base of the earthen berm in the northwest corner of the landfill – verified that landfill gas is not migrating towards the northwest.
4. GW-18 – located west of GW-13 along the western property boundary, immediately north of the gas cutoff trench – indicated that while the methane gas concentration measured in GW-13 was more than 50 percent higher than the methane gas concentration measured at GW-18, methane gas at concentrations above the LEL are still present at the western property boundary.
5. GW-19 – located along the western property boundary, approximately 170 feet northwest of GW 13 – indicated that methane gas concentrations about the LEL are present at the western property boundary to the northwest of the landfill gas cutoff trench.

As Georgia-Pacific and MDEQ have previously discussed, the above information when combined with the following supplementary site information indicates that the methane gas concentrations detected at the western property boundary of the KHL does not present a significant risk to the adjacent property (Kalamazoo Metal Recyclers, Inc. [KMR] or the City of Kalamazoo underground utilities).

1. Methane gas at concentrations above the LEL may be present for a distance of up to 275 feet along the western property boundary and could be migrating under the continuous concrete slab present immediately across the property line on KMR's property. KMR's buildings are all constructed above grade.

2. The City of Kalamazoo 72-inch diameter sanitary sewer is located about 6 feet below ground surface. As verified by the hydro excavation performed during installation of the new permanent gas probes in May 2013, the sewer is constructed of concrete pipe with compacted sand backfill, and most of the sewer is below the groundwater surface. The sewer is located between the western limit of waste boundary² and the western property boundary, leaving no space for construction of additional gas cut off trench unless the trench was installed within the limits of waste. Monitoring of the atmosphere inside the sewer at the four manholes located along the western property boundary did not indicate the presence of methane gas above the LEL. Monitoring of the atmosphere in and around the sewer during construction of the force main in 2012³ did not indicate the presence of landfill gas at the connection point located adjacent to the northwest corner of the landfill.

In accordance with the contingency actions in Section 3.6 of the O&M Plan (ARCADIS 2013a), if methane gas is observed at any of the perimeter monitoring locations at concentrations greater than the LEL, then the adjacent property owner will be notified of the elevated methane concentrations detected at the perimeter of the KHL. As such, the KMR was notified on June 13, 2013 in a letter discussing the recent detections of methane gas at concentrations above the LEL in gas probes GW-18 and GW-19 located along the western property boundary of the KHL (Georgia-Pacific 2013a). The letter indicated that, based on discussions between Georgia-Pacific and the MDEQ, it was agreed the methane detections along the western property boundary of the KHL do not pose a risk to personnel employed at the KMR facility due to the presence of the concrete slab floor covering the ground surface and the absence of any subsurface structures at the facility.

Based on the aforementioned information that was discussed with MDEQ and provided by Georgia-Pacific to KMR regarding the methane detections along the perimeter of the KHL to adjacent properties, Georgia-Pacific does not see a need for any further investigation or remediation at this time. Georgia-Pacific will continue quarterly gas monitoring and, if gas probe monitoring indicates off-site migration of gas concentrations about the LEL, will notify KMR.

²The approximate limit of waste boundary is identified on Figure 6 of the *Final Report for Completion of Construction Report* (ARCADIS 2013c).

³During the recent installation of a new force main between the existing 72-inch sanitary sewer line northwest of the KHL and ending at the Riverview Pump Station, the City's contractor (Jones & Henry Engineers, Ltd.) used hand-held air monitors to measure gas levels in the excavation areas where personnel were entering the excavations. As indicated in an email from the contractor to Georgia-Pacific (Jones & Henry Engineers, Ltd. 2013), monitoring did not reveal any concentrations exceeding levels required for personnel to enter the excavation areas, which further indicates that methane gas is not migrating off-site through the sanitary sewer pipe at concentrations above the LEL.



Mr. Keith Krawczyk
July 18, 2013

The next round of data collection (i.e., the 2013 third quarter landfill gas monitoring event) will be conducted in July 2013.

If you have any questions or comments, please do not hesitate to contact me at 315.671.9233.

Sincerely,

ARCADIS

A handwritten signature in black ink, appearing to read "PKM" followed by a surname.

Patrick McGuire
Principal Environmental Engineer

Attachments

Copies:

Garry Griffith, P.E., Georgia-Pacific LLC (transmitted via e-mail)
Michael Berkoff, USEPA Region 5
Steve Taplin, Terra Contracting, LLC (transmitted via e-mail)
Matt Johnson, Senior Civil Engineer, City of Kalamazoo
Roberta Welke, Southwest Region Engineer, Michigan Department of Transportation
Dawn Penniman, P.E., ARCADIS

References

ARCADIS. 2013a. *FINAL Operation and Maintenance Plan*. King Highway Landfill Operable Unit 3. May 6, 2013.

ARCADIS. 2013b. *Investigation Plan for Off-Site Landfill Gas Migration at the King Highway Landfill*. March 13, 2013.

ARCADIS. 2013c. *Final Report for Completion of Construction*. King Highway Landfill Operable Unit 3. May 6, 2013.

Georgia-Pacific. 2013. *Detection of Methane Gas along the Western Property Boundary of the King Highway Landfill*. June 13, 2013.

Jones & Henry Engineers, Ltd. 2013. *Email Regarding Force Main Installation Air Monitoring*. June 7, 2013.

MDEQ. 2013. *Conclusion of Review of the Latest Draft Final Operation and Maintenance Plan and the Construction Completion Report*. April 23, 2013.



Tables

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 1 - Summary of May 31, 2013 Post-Closure Landfill Gas Monitoring Results

Sample Location	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)	Top of Casing Elevation (feet)	Depth to Water ¹ (feet)	Water Elevation (feet)	Top of Screen Elevation (feet)
GW-1	50.0	50.0	0.0	0.0	772.69	16.48	756.21	766.75
GW-2	51.5	41.8	0.0	6.7	768.36	N/A	N/A	762.26
GW-3	20.2	14.3	0.0	65.5	764.96	9.05	755.91	759.23
GW-4	45.9	48.5	0.8	4.8	770.21	13.88	756.33	764.44
GW-5	0.1	1.7	13.0	85.2	766.40	--	--	764.20
GW-6	0.1	0.8	15.4	83.7	765.10	N/A	N/A	762.90
GW-7	0.1	3.5	17.0	79.4	764.90	--	--	761.70
GW-8	0.1	9.8	11.0	79.1	764.60	N/A	N/A	762.40
GW-9	0.1	3.9	15.2	80.8	761.80	--	--	759.60
GW-10	0.1	9.9	6.3	83.7	767.30	--	--	765.10
GW-11	0.8	19.2	0.0	80.0	765.00	--	--	762.80
GW-12	0.0	6.1	11.5	82.4	764.50	7.94	756.56	762.30
GW-13 ¹⁰	48.8	51.5	0.0	0.0	771.08	N/A	N/A	764.67
GW-14	10.0	2.2	4.9	82.9	762.61	5.55	757.06	757.12
GW-15	0.0	5.8	14.6	79.6	766.27	N/A	N/A	759.30
GW-15A	3.2	13.6	0.8	82.4	763.00	N/A	N/A	762.00
GW-16	0.0	2.6	15.8	81.6	764.44	N/A	N/A	757.82
GW-17	0.1	1.4	18.0	80.5	763.84	N/A	N/A	757.30
GW-18	21.4	3.7	0.2	74.7	771.80	12.15	759.65	765.80
GW-19	43.3	43.9	1.1	11.7	772.50	17.40	755.10	766.50
GW-20	0.1	8.1	10.9	80.9	779.00	12.50	766.50	771.00
GW-21	0.2	2.6	12.6	84.6	768.00	8.53	759.47	761.60
Storage Shed	0.2	0.0	21.0	78.8	NM	NM	NM	NM
Manhole #11	0.1	0.9	19.7	79.3	NM	NM	NM	NM
Manhole #12	0.0	0.9	19.4	79.7	NM	NM	NM	NM
Manhole #14	0.1	0.9	19.8	79.2	NM	NM	NM	NM
Manhole #15	0.3	1.1	19.7	78.9	NM	NM	NM	NM

Notes:

- ¹ Depth to water was measured from the top of the casing for each gas probe.
- 1. Landfill gas monitoring results provided by ARCADIS using a GEM™ 500 portable gas analyzer.
- 2. CH₄ = Methane.
- 3. CO₂ = Carbon Dioxide.
- 4. O₂ = Oxygen.
- 5. GW = Permanent gas monitoring probe.
- 6. N/A = Water was not observed to be present in the gas probe during the time of measurement.
- 7. -- = Water depth measurements were not collected because the cap could not be removed from the gas probe.
- 8. NM = Water depth measurements were not collected from the four manholes, only landfill gas measurements.
- 9. Shaded methane results exceed the associated lower explosive limit (5%).
- 10. Due to rapid fluctuations in the gas concentration readings on the portable gas analyzer, the concentrations for all parameters (i.e., CH₄, O₂, and CO₂) could not be determined from the same reading, producing a balance nitrogen concentration for GW-13 less than zero.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-1	4/28/2003	46.3	42.9	1.9	8.9
GW-2	4/28/2003	47.2	29.5	4	19.3
GW-3	4/28/2003	74.1	19.1	0.6	6.3
GW-4	4/28/2003	47.1	39.9	2.6	10.4
BH-2	4/28/2003	52.3	46.8	0	0.9
BH-4	4/28/2003	17.8	8.8	9.8	63.6
BH-5	4/28/2003	2.8	5.2	15.2	76.8
BH-8	4/28/2003	55.4	43	0	1.6
BH-9	4/28/2003	26.6	33.2	2.2	38
BH-10	4/28/2003	0	0.7	18.6	80.7
BH-11	4/28/2003	0.3	4.3	13.3	82.1
BH-12	4/28/2003	0	0.3	20	79.7
BH-13	4/28/2003	0	1.3	19.3	79.4
BH-14	4/28/2003	0	1.9	17.7	80.4
BH-15	4/28/2003	9	4.3	9.7	77
BH-16	4/28/2003	0	1.4	18.7	79.9
BH-17	4/28/2003	0	0	20.5	79.5
BH-18	4/28/2003	1.3	0.7	19.7	78.3
GW-1	8/14/2003	49.6	43.7	1	5.7
GW-2	8/14/2003	59.2	35.2	0.9	4.7
GW-3	8/14/2003	48.6	30	1.6	19.8
GW-4	8/14/2003	41.4	43	0.2	15.4
BH-105	8/14/2003	46.8	43.6	0.8	8.8
BH-106	8/14/2003	4.1	16	2.1	77.8
BH-107	8/14/2003	29.6	27.9	2.9	39.6
BH-108	8/14/2003	1.8	11	10.6	76.6
BH-109	8/14/2003	3.6	3.2	15.3	77.9
BH-110	8/14/2003	0	1.1	18.9	80
BH-111	8/14/2003	0	9.3	6.6	84.1
BH-112	8/14/2003	27.6	29.6	0.9	41.9
BH-113	8/14/2003	31	26.2	3.7	39.1
BH-114	8/14/2003	0	1.1	18.6	80.3
BH-115	8/15/2003	36.2	25.9	1.9	36
BH-116	8/14/2003	0	5.1	11.4	83.5
BH-117	8/14/2003	0	1.6	17.3	81.1
BH-118	8/14/2003	31.2	34.3	1.5	33
BH-119	8/14/2003	33.5	26.5	4.4	35.6
BH-120	8/14/2003	3.8	7.2	14.4	74.6
BH-121	8/14/2003	0	0.1	19	80.9
BH-122	8/14/2003	0.6	0.8	18.9	79.7
GW-1	11/12/2003	56.9	42.4	0.5	0.2
GW-2	11/12/2003	65.9	33.4	0.5	0.2
GW-3	11/12/2003	68.7	28.1	3.1	0.1
GW-4	11/12/2003	59.2	34	6.7	0.1
V-1	11/12/2003	72.2	27.2	0.5	0.1
V-2	11/12/2003	51.9	28.7	4.5	14.9
V-3	11/12/2003	66.4	32.9	0.6	0.1
BH-202	11/12/2003	57.5	39.7	2.6	0.2
BH-203	11/12/2003	0.2	0.2	20.1	79.5
BH-204	11/12/2003	41.9	13.3	11	33.8
BH-205	11/12/2003	0.1	0	20.7	79.2
BH-206	11/12/2003	1.4	3.3	8.6	86.7
BH-207	11/12/2003	12.2	11.8	8.7	67.3
BH-208	11/12/2003	66	29.2	2.3	2.5
BH-209	11/12/2003	24.4	8.5	1.9	65.2
BH-210	11/12/2003	0.1	3	16.7	80.2
BH-211	11/12/2003	28.8	5.6	13.2	52.4
BH-212	11/12/2003	16.6	9.2	2.2	72
BH-213	11/13/2003	15.5	4.8	15.5	64.2
BH-214	11/12/2003	0.5	1.4	18.1	80
BH-215	11/12/2003	0.1	2.1	17.4	80.4
BH-216	11/12/2003	0	0	20.9	79.1
BH-217	11/12/2003	0	0.8	20.6	78.6

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
BH-218	11/12/2003	0	1.2	19.8	79
BH-219	11/12/2003	0	0	21.1	78.9
BH-220	11/12/2003	0	0	20.8	79.2
BH-221	11/12/2003	0.1	5.7	8.5	85.7
BH-222	11/12/2003	0	1.5	17.9	80.6
BH-223	11/12/2003	0	1.2	19.4	79.4
BH-230	11/12/2003	65.6	23.8	0.7	9.9
BH-231	11/12/2003	0.5	0.9	20.5	78.1
BH-232	11/12/2003	57.7	30.1	3.2	9
BH-233	11/12/2003	0.6	0.1	18.5	80.8
BH-234	11/12/2003	0.1	0.9	19.8	79.2
GW-1	12/8/2003	57.3	42.1	0.4	0.2
GW-2	12/8/2003	65.4	32.0	0.7	1.9
GW-3	12/8/2003	65.9	14.6	0.8	18.7
GW-4	12/8/2003	63.0	36.1	0.8	0.1
BH-301	12/8/2003	55.6	26.3	4.1	14.0
BH-302	12/8/2003	6.4	2.1	16.7	74.8
BH-303	12/8/2003	9.7	6.7	14.5	69.1
BH-304	12/8/2003	4.2	6.9	9.3	79.6
BH-305	12/8/2003	60.3	33.4	1.6	4.7
BH-306	12/9/2003	5.5	2.8	14.7	77.0
BH-307	12/8/2003	2.4	1.6	17.3	78.7
BH-312	12/8/2003	0	0.5	20.3	79.2
BH-313	12/8/2003	31.7	12.6	8.2	47.5
BH-314	12/8/2003	0	1.8	17.7	80.5
BH-315	12/9/2003	2.9	4.4	12.3	80.4
BH-316	12/8/2003	0	0.1	20.4	79.5
BH-317	12/8/2003	0	4.2	15.2	80.6
BH-318	12/8/2003	0	0.3	19.0	80.7
GW-1	2/24/2004	21.3	17.8	10.1	50.8
GW-2	2/24/2004	34.9	24	6.4	34.7
GW-3	2/24/2004	0.1	0	19.5	80.4
GW-3	2/24/2004	0	0	20.1	79.9
GW-4	2/24/2004	8	6.5	16.1	69.4
GW-4	2/24/2004	0	0	19.2	80.8
V-1	2/24/2004	0	0	20.1	79.9
V-2	2/24/2004	13.5	7.3	16	63.2
V-3	2/24/2004	39	20.3	10.1	30.6
BH-10	2/24/2004	19.4	12.1	16.6	51.9
BH-105	2/24/2004	19.1	8.1	9.9	62.9
BH-106	2/24/2004	3.1	1.3	17.8	77.8
BH-107	2/24/2004	15.3	12.4	9.3	63
BH-108	2/24/2004	2.1	1.8	16.4	79.7
BH-110	2/24/2004	15.2	11.7	4.9	68.2
BH-111	2/24/2004	7.6	5	11.1	76.3
BH-112	2/24/2004	0.6	2.2	18.4	78.8
BH-113	2/24/2004	0	2.3	15.9	81.8
BH-114	2/24/2004	0	0.5	18.3	81.2
BH-115	2/24/2004	0	0	19.9	80.1
BH-116	2/24/2004	0	0.7	16.8	82.5
BH-117	2/24/2004	0	0	19.6	80.4
BH-118	2/24/2004	0	0.1	19	80.9
BH-119	2/24/2004	20.6	7.7	10	61.7
BH-120	2/24/2004	2.4	7	13	77.6
BH-126	2/24/2004	33.1	16.5	14.3	36.1
BH-127	2/24/2004	19.5	10.8	13.9	55.8
BH-128	2/24/2004	0	0	19.9	80.1
BH-129	2/24/2004	42.3	26.2	15.7	15.8
BH-130	2/24/2004	1.3	0.6	19.2	78.9
BH-131	2/24/2004	54.9	32.3	12.6	0.2
BH-132	2/24/2004	0.8	0.4	18.3	80.5
BH-133	2/24/2004	0	0.7	19.5	79.8

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-1	5/20/2004	51.3	32.3	0.1	16.3
GW-2	5/20/2004	62.0	37.3	0.5	0.2
GW-3	5/20/2004	69.2	30.2	0.4	0.2
GW-4	5/20/2004	54.7	45.1	0.1	0.1
V-1	5/20/2004	55.3	22.9	6.2	15.6
V-2	5/20/2004	54.0	30.0	4.3	11.7
V-3	5/20/2004	59.3	40.2	0.3	0.2
BH-208	5/20/2004	0.4	1.6	19.9	78.1
BH-209	5/20/2004	0.2	0.5	19.5	79.8
BH-210	5/20/2004	14.1	12.1	5.2	68.6
BH-211	5/20/2004	0.1	2.8	18.1	79.0
BH-212	5/20/2004	28.3	13.5	3.8	54.4
BH-213	5/20/2004	0.2	2.7	16.5	80.6
BH-214	5/20/2004	0.1	1.9	18.5	79.5
BH-215	5/20/2004	67.9	21.9	1.8	8.4
BH-216	5/20/2004	0	1.7	19.0	79.3
BH-217	5/20/2004	0	3.5	15.7	80.8
BH-218	5/20/2004	24.9	23.8	4.6	46.7
BH-219	5/20/2004	8.8	10.2	10.9	70.1
BH-220	5/20/2004	0.2	0.7	20.4	78.7
BH-221	5/20/2004	10.4	7.9	7.3	74.4
BH-222	5/20/2004	17.0	8.9	5.0	69.1
BH-223	5/20/2004	0	0.1	21.1	78.8
BH-224	5/20/2004	0	7.1	9.5	83.4
BH-225	5/20/2004	0	1.9	19.4	78.7
BH-226	5/20/2004	0	2.0	17.1	80.9
BH-227	5/20/2004	0	1.0	20.1	78.9
BH-228	5/20/2004	15.8	11.7	11.7	60.8
BH-229	5/20/2004	7.3	9.4	8.0	75.3
BH-230	5/20/2004	2.0	2.4	16.4	79.3
BH-231	5/20/2004	44.8	40.2	1.9	13.1
BH-232	5/20/2004	1.3	2.1	16.0	80.6
BH-233	5/20/2004	0	0.1	21.2	78.7
BH-234	5/20/2004	45.5	36.8	2.2	15.5
BH-235	5/20/2004	8.8	3.3	17.7	70.2
BH-236	5/20/2004	2.1	1.0	17.6	79.3
BH-237	5/20/2004	0.5	1.5	18.6	79.4
GW-1	9/29/2004	41.9	35.4	4.2	18.5
GW-2	9/29/2004	37.8	24.9	7.7	29.6
GW-3	9/29/2004	36.2	25.7	5.4	32.7
GW-4	9/29/2004	35.7	32.9	5.3	26.1
V-1-1	9/29/2004	27.4	22.2	10.4	40
V-2-1	9/29/2004	44.1	19.4	7.2	29.3
V-2-2	9/29/2004	33.7	20.4	9.7	36.2
V-4-1	9/29/2004	0	0.4	20.6	79
V-4-2	9/29/2004	0	0.3	20.6	79.1
V-4-3	9/29/2004	0	0	20.7	79.3
BH-101	9/29/2004	43.7	39.6	2.5	14.2
BH-102	9/29/2004	34.7	38.3	1.1	25.9
BH-103	9/29/2004	16.9	31.9	0.8	50.4
BH-104	9/29/2004	11.1	26.7	2.9	59.3
BH-105	9/29/2004	11.1	27.3	0.9	60.7
BH-106	9/29/2004	42.1	21.3	8.2	28.4
BH-107	9/29/2004	1.3	1.4	18	79.3
BH-108	9/29/2004	43.4	28.9	1	26.7
BH-109	9/29/2004	26.2	9.4	2.2	62.2
BH-110	9/29/2004	1.5	9.8	7.1	81.6
BH-111	9/29/2004	0	6.8	12.9	80.3
BH-112	9/29/2004	1.4	11.2	3.6	83.8
BH-113	9/29/2004	0.5	2.6	17.1	79.8
BH-114	9/29/2004	25.4	11.2	2.4	61

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
BH-201	9/29/2004	46.7	13.7	2.8	36.8
BH-202	9/29/2004	42.2	17.7	7.9	32.2
BH-203	9/29/2004	0	1.4	19.4	79.2
GW-1	12/16/2004	56.6	43.4	0	0
GW-2	12/16/2004	55.3	33.9	0	10.8
GW-3	12/16/2004	40.5	14.7	0.3	44.5
GW-4	12/16/2004	59.4	37.0	1.1	2.5
V-1-1	12/16/2004	60.7	38.9	0.4	0
V-2-1	12/16/2004	35.9	16.7	6.3	41.1
V-2-2	12/16/2004	46.8	22.4	6.8	24.0
V-4-1	12/16/2004	3.9	2.2	19.0	74.9
V-4-2	12/16/2004	0	0	20.4	79.6
V-4-3	12/16/2004	0	0	20.4	79.6
BH-101	12/16/2004	1.4	0.9	19.9	77.8
BH-102	12/16/2004	57.6	7.2	1.4	33.8
BH-103	12/16/2004	0	1.9	18.3	79.8
BH-104	12/16/2004	0	1.5	18.0	80.5
BH-105	12/16/2004	0.2	0.5	18.4	80.9
BH-106	12/16/2004	0	0.7	18.5	80.8
BH-107	12/16/2004	2.5	0.9	17.8	78.8
BH-201	12/16/2004	0	1.7	16.1	82.2
BH-202	12/16/2004	0.1	0.4	19.4	80.1
BH-203	12/16/2004	12.0	4.4	12.6	71.0
BH-204	12/16/2004	56.1	13.5	5.3	25.1
BH-205	12/16/2004	5.6	0.8	15.8	77.8
BH-301	12/16/2004	0	9.7	8.5	81.8
BH-401	12/16/2004	64.7	34.5	0.5	0.3
BH-402	12/16/2004	0.1	0.3	17.8	81.8
GW-1	3/15/2005	52.6	42.2	1.3	3.9
GW-2	3/15/2005	0.2	1.6	18.8	79.4
GW-3	3/15/2005	0	0	20.8	79.2
GW-4	3/15/2005	58.3	38.1	1.5	2.1
V-1-1	3/15/2005	20.4	11.2	15.2	53.2
V-2-1	3/15/2005	0	0	20.8	79.2
V-2-2	3/15/2005	5.3	1.8	19.3	73.6
V-4-1	3/15/2005	0	0.1	19.6	80.3
V-4-2	3/15/2005	2.7	1.6	19.0	76.7
V-4-3	3/15/2005	2.5	2.2	19.1	76.2
BH-101	3/15/2005	1.4	0.4	20.3	77.9
BH-104	3/15/2005	0.6	0.4	20.1	78.9
BH-105	3/15/2005	0	2.3	13.4	84.3
BH-107	3/15/2005	3.4	0.3	19.1	77.2
GW-1	5/26/2005	54.5	44.7	0.6	0.2
GW-2	5/26/2005	58.5	39.5	0.0	2.0
GW-3	5/26/2005	58.7	30.4	0.2	10.7
GW-4	5/26/2005	42.2	38.4	0.4	19.0
GW-5	5/26/2005	0.8	0.4	18.1	80.7
GW-6	5/26/2005	0.7	1.3	19.7	78.3
GW-7	5/26/2005	0.2	1.6	16.9	81.3
GW-8	5/26/2005	0.0	10.7	2.8	86.5
GW-9	5/26/2005	0.2	3.0	16.0	80.8
V-1-1	5/26/2005	12.2	7.9	17.1	62.8
V-2-1	5/26/2005	14.0	5.9	15.9	64.2
V-2-2	5/26/2005	23.3	13.0	12.6	51.1
V-3-1	5/26/2005	5.2	2.0	18.3	74.5
V-4-1	5/26/2005	3.6	4.1	16.0	76.3
V-4-2	5/26/2005	2.3	2.1	19.6	76.0
V-4-3	5/26/2005	1.6	2.4	18.7	77.3
BH-101	5/26/2005	1.2	2.4	18.3	78.1
BH-102	5/26/2005	0.6	1.1	15.4	82.9
BH-103	5/26/2005	0.0	0.9	19.3	79.8
BH-201	5/26/2005	10.9	6.4	15.4	67.3
BH-202	5/26/2005	0.3	1.0	18.8	79.9

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
BH-203	5/26/2005	0.4	1.2	12.8	85.6
BH-301	5/26/2005	3.0	6.1	12.7	78.2
BH-302	5/26/2005	4.3	11.0	73.9	10.8
BH-303	5/26/2005	3.8	9.4	11.7	75.1
BH-304	5/26/2005	0.0	0.4	20.0	79.6
GW-1	8/18/2005	51.0	44.8	0.3	3.9
GW-2	8/18/2005	53.3	36.9	1.5	8.3
GW-3	8/18/2005	52.6	33.9	0.0	13.5
GW-4	8/18/2005	48.2	45.1	0.0	6.7
GW-5	8/18/2005	40.0	13.8	0.3	45.9
GW-6	8/18/2005	51.9	43.7	0.0	4.4
GW-7	8/18/2005	0.0	3.8	16.5	79.7
GW-8	8/18/2005	5.8	10.1	0.2	83.9
GW-9	8/18/2005	0.0	7.2	12.5	80.3
GW-10	8/18/2005	0.0	12.9	4.8	82.3
GW-11	8/18/2005	0.0	18.9	2.7	78.4
V-1-1	8/18/2005	52.3	47.6	0.0	0.1
V-2-2	8/18/2005	39.5	26.8	6.5	27.2
V-3-1	8/18/2005	14.9	16.4	8.3	60.4
V-4-1	8/18/2005	14.1	18.0	8.1	59.8
V-4-2	8/18/2005	20.6	24.1	6.0	49.3
V-4-3	8/18/2005	17.5	19.9	9.2	53.4
BH-101	8/18/2005	59.9	20.8	0.1	19.2
BH-102	8/18/2005	44.4	40.2	0.7	14.7
BH-103	8/18/2005	0.0	3.1	17.9	79.0
BH-104	8/18/2005	12.3	4.0	14.3	69.4
BH-105	8/18/2005	0.0	2.6	18.1	79.3
BH-106	8/18/2005	0.0	1.0	20.6	78.4
BH-201	8/18/2005	22.0	21.8	0.5	55.7
BH-202	8/18/2005	0.0	12.2	9.0	78.8
BH-203	8/18/2005	22.4	9.7	12.9	55.0
BH-204	8/18/2005	26.7	18.9	2.9	51.5
BH-205	8/18/2005	0.8	2.2	0.7	96.3
BH-301	8/18/2005	16.8	23.1	0.7	59.4
BH-302	8/18/2005	0.0	10.9	7.1	82.0
BH-303	8/18/2005	25.3	23.0	0.5	51.2
BH-304	8/18/2005	11.4	15.0	3.1	70.5
BH-305	8/18/2005	0.1	11.3	9.4	79.2
BH-306	8/18/2005	0.0	6.4	16.1	77.5
BH-307	8/18/2005	0.0	5.5	17.5	77.0
BH-701	8/18/2005	0.0	3.1	18.3	78.6
BH-801	8/18/2005	0.0	1.2	20.4	78.4
BH-802	8/18/2005	0.0	1.9	19.8	78.3
BH-100	8/18/2005	0.0	7.4	12.1	80.5
BH-100	8/18/2005	0.0	0.5	20.5	79.0
BH-110	8/18/2005	0.0	3.6	18.2	78.2
BH-110	8/18/2005	0.0	10.2	11.6	78.2
GW-1	11/8/2005	53.2	45.3	0.2	1.3
GW-2	11/8/2005	41.8	30.6	3.2	24.4
GW-3	11/8/2005	6.2	8.0	14.5	71.3
GW-4	11/8/2005	48.8	39.0	0.4	11.8
GW-5	11/8/2005	24.5	12.6	0.2	62.7
GW-6	11/8/2005	53.6	39.4	0.4	6.6
GW-7	11/8/2005	0.0	3.2	16.8	80.0
GW-8	11/8/2005	0.0	13.4	0.6	86.0
GW-9	11/8/2005	0.0	3.8	15.4	80.8
GW-10	11/8/2005	0.0	9.5	7.0	83.5
GW-11	11/8/2005	0.0	12.1	6.0	81.9
BH-101	11/8/2005	27.0	13.8	5.3	53.9
BH-102	11/8/2005	26.0	32.5	0.3	41.2
BH-103	11/8/2005	0.0	2.1	17.4	80.5
BH-104	11/8/2005	0.0	8.1	7.6	84.3
BH-201	11/8/2005	22.5	23.5	0.4	53.6

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
BH-202	11/8/2005	0.0	6.2	13.8	80.0
BH-301	11/8/2005	0.0	18.4	1.7	79.9
BH-601	11/8/2005	5.4	12.2	0.4	82.0
BH-602	11/8/2005	0.0	3.5	15.8	80.7
V-1-1	11/8/2005	54.2	45.2	0.6	0.0
V-2-1	11/8/2005	10.0	6.9	14.5	68.6
V-2-2	11/8/2005	47.4	28.1	5.8	18.7
V-3-1	11/8/2005	5.6	2.0	18.9	73.5
V-4-1	11/8/2005	1.0	2.9	17.7	78.4
V-4-2	11/8/2005	0.0	0.0	20.5	79.5
V-4-3	11/8/2005	3.3	7.0	13.8	75.9
GW-1	2/8/2006	56.0	43.7	0.3	0.0
GW-2	2/8/2006	41.0	24.9	2.5	31.6
GW-3	2/8/2006	0.8	4.8	10.3	84.1
GW-4	2/8/2006	63.1	36.2	0.7	0.0
GW-5	2/8/2006	36.7	4.0	1.0	58.3
GW-6	2/8/2006	83.7	14.3	0.0	2.0
GW-7	2/8/2006	0.0	1.5	17.7	80.8
GW-8	2/8/2006	20.0	5.5	1.9	72.6
GW-9	2/8/2006	0.0	4.3	15.1	80.6
GW-10	2/8/2006	0.0	7.4	1.4	91.2
GW-11	2/8/2006	0.0	1.2	19.0	79.8
BH-201 ⁴	2/8/2006	6.1	4.2	13.3	76.4
BH-501	2/8/2006	0.1	1.0	16.1	82.8
BH-502	2/8/2006	0.0	0.2	17.9	81.9
BH-801	2/8/2006	0.0	4.4	15.5	80.1
BH-430	2/8/2006	32.9	18.1	3.5	45.5
BH-430	2/8/2006	34.2	22.9	0.0	42.9
BH-430	2/8/2006	7.6	7.9	11.9	72.6
BH-430	2/8/2006	0.7	0.4	17.3	81.6
V-1-1	2/8/2006	56.8	39.6	3.6	0.0
V-2-1	2/8/2006	16.2	6.5	15.8	61.5
V-2-2	2/8/2006	29.6	10.5	13.5	46.4
V-3-1	2/8/2006	2.8	0.7	20.5	76.0
V-4-1	2/8/2006	0.5	0.5	19.0	80.0
V-4-2	2/8/2006	0.0	0.1	19.0	80.9
V-4-3	2/8/2006	22.1	11.5	11.1	55.3
GW-1	5/8/2006	52.8	47.2	0.0	0.0
GW-2	5/8/2006	58.2	40.4	0.0	1.4
GW-3	5/8/2006	66.2	28.0	0.0	5.8
GW-4	5/8/2006	0.0	46.3	0.0	53.7
GW-5	5/8/2006	31.6	4.5	0.0	63.9
GW-6	5/8/2006	61.8	29.4	0.0	8.8
GW-7	5/8/2006	0.0	1.5	16.1	82.4
GW-8	5/8/2006	15.8	6.3	0.0	77.9
GW-9	5/8/2006	0.0	7.4	6.6	86.0
GW-10	5/8/2006	0.0	0.3	18.3	81.4
GW-11	5/8/2006	0.0	10.1	3.8	86.1
GW-12	5/8/2006	0.0	10.4	6.1	83.5
BH-201	5/8/2006	49.5	21.2	0.0	29.3
BH-202	5/8/2006	0.1	4.2	12.1	83.6
BH-301	5/8/2006	15.5	12.0	6.5	66.0
BH-302	5/8/2006	25.4	18.8	0.0	55.8
BH-303	5/8/2006	0.0	0.4	18.3	81.3
BH-304	5/8/2006	13.7	7.9	5.9	72.5
BH-305	5/8/2006	4.7	3.8	9.9	81.6
BH-306 ⁵	5/8/2006	--	--	--	--
BH-307	5/8/2006	9.0	11.1	0.0	79.9
BH-308 ⁵	5/8/2006	--	--	--	--
BH-309	5/8/2006	0.0	0.4	18.2	81.4
BH-310	5/8/2006	38.1	7.5	0.0	54.4
BH-311	5/8/2006	0.0	0.4	18.3	81.3
BH-312	5/8/2006	0.8	6.8	6.2	86.2

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
BH-501	5/8/2006	0.0	0.9	17.2	81.9
BH-502	5/8/2006	0.0	4.1	7.4	88.5
BH-601	5/8/2006	51.1	8.6	0.0	40.3
BH-801	5/8/2006	3.4	12.8	0.0	83.8
BH-802	5/8/2006	0.0	0.8	16.7	82.5
V-1-1	5/8/2006	52.3	46.7	0.0	1.0
V-2-1	5/8/2006	44.0	29.7	0.0	26.3
V-2-2	5/8/2006	53.5	23.9	5.5	17.1
V-3-1	5/8/2006	26.4	9.4	12.2	52.0
V-4-1	5/8/2006	0.0	0.0	20.3	79.7
V-4-2	5/8/2006	0.0	0.0	20.5	79.5
V-4-3	5/8/2006	0.0	0.1	20.1	79.8
V-4-4	5/8/2006	0.0	0.0	20.2	79.8
V-4-5	5/8/2006	0.0	0.8	19.0	80.2
V-4-6	5/8/2006	0.0	0.0	20.0	80.0
GW-1	9/7/2006	53.6	46.4	0.0	0.0
GW-2	9/7/2006	42.0	30.2	5.7	22.1
GW-3	9/7/2006	49.9	26.5	3.2	20.4
GW-4	9/7/2006	50.4	44.9	0.9	3.8
GW-5	9/7/2006	46.1	8.7	0.0	45.2
GW-6	9/7/2006	60.7	38.2	0.0	1.1
GW-7	9/7/2006	0.0	5.0	14.8	80.2
GW-8	9/7/2006	34.6	5.8	0.0	59.6
GW-9	9/7/2006	1.4	13.5	0.1	85.0
GW-10	9/7/2006	0.0	0.6	20.2	79.2
GW-11	9/7/2006	0.3	8.0	7.1	84.6
GW-12	9/7/2006	0.0	0.1	20.8	79.1
BH-201	9/7/2006	29.7	14.1	9.5	46.7
BH-202	9/7/2006	0.0	1.3	19.8	78.9
BH-301	9/7/2006	0.8	2.7	18.1	78.4
BH-302	9/7/2006	3.8	3.7	17.3	75.2
BH-303	9/7/2006	12.3	16.1	3.7	67.9
BH-304	9/7/2006	4.0	1.5	19.0	75.5
BH-305	9/7/2006	0.0	2.4	19.1	78.5
BH-501	9/7/2006	0.0	2.3	18.2	79.5
BH-502	9/7/2006	1.0	2.8	16.0	80.2
BH-601	9/7/2006	0.0	0.2	20.9	78.9
BH-801	9/7/2006	0.0	3.0	17.8	79.2
BH-802	9/7/2006	4.4	3.1	13.7	78.8
V-1-1	9/7/2006	30.7	28.6	8.7	32.0
V-2-1	9/7/2006	25.5	12.6	12.6	49.3
V-2-2	9/7/2006	18.6	11.3	14.1	56.0
V-3-1	9/7/2006	2.6	1.5	20.1	75.8
V-4-1	9/7/2006	0.0	0.1	20.8	79.1
V-4-2	9/7/2006	0.0	0.2	2.9	96.9
V-4-3	9/7/2006	0.0	0.0	20.8	79.2
V-4-4	9/7/2006	0.0	0.0	20.9	79.1
V-4-5	9/7/2006	0.0	0.1	20.8	79.1
V-4-6	9/7/2006	0.0	0.1	20.9	79.0
GW-1	11/8/2006	54.9	45.1	0.0	0.0
GW-2	11/8/2006	54.2	35.8	0.0	10.0
GW-3	11/8/2006	63.1	25.5	0.0	11.4
GW-4	11/8/2006	57.4	41.6	0.0	1.0
GW-5	11/8/2006	56.6	4.2	0.0	39.2
GW-6	11/8/2006	72.6	23.5	0.0	3.9
GW-7	11/8/2006	0.0	0.2	20.4	79.4
GW-8	11/8/2006	46.0	5.3	0.0	48.7
GW-9	11/8/2006	25.4	8.9	0.0	65.7
GW-10	11/8/2006	0.4	9.3	0.0	90.3
GW-11	11/8/2006	0.0	8.4	5.2	86.4
GW-12	11/8/2006	0.0	4.4	15.2	80.4
BH-201	11/8/2006	0.2	2.4	15.5	81.9
BH-301	11/8/2006	0.0	0.0	19.8	80.2

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
BH-501	11/8/2006	3.5	1.7	11.3	83.5
BH-502	11/8/2006	0.0	2.2	16.8	81.0
BH-801	11/8/2006	17.4	3.5	6.9	72.2
BH-802	11/8/2006	0.0	0.8	20.1	79.1
BH-901	11/8/2006	0.0	1.3	19.5	79.2
V-1-1	11/8/2006	54.9	43.8	0.0	1.3
V-2-1	11/8/2006	53.1	22.1	2.3	22.5
V-2-2	11/8/2006	51.4	27.2	0.0	21.4
V-3-1	11/8/2006	14.4	6.1	15.2	64.3
V-4-1	11/8/2006	17.4	15.2	9.9	57.5
V-4-2	11/8/2006	0.0	0.0	22.1	77.9
V-4-3	11/8/2006	5.8	8.3	13.1	72.8
V-4-4	11/8/2006	0.0	0.0	21.7	78.3
V-4-5	11/8/2006	0.0	0.1	21.7	78.2
V-4-6	11/8/2006	0.0	0.0	21.8	78.2
GW-1	2/8/2007	54.9	44.5	0.0	0.6
GW-2	2/8/2007	40.5	27.9	0.8	30.8
GW-3	2/8/2007	34.8	9.6	2.8	52.8
GW-4 ⁶	2/8/2007	60.5	39.5	0.0	0.0
GW-5	2/8/2007	49.9	3.3	0.0	46.8
GW-6 ⁷	2/8/2007	17.6	2.8	16.2	63.4
GW-7	2/8/2007	0.0	0.1	20.8	79.1
GW-8	2/8/2007	0.9	2.5	14.0	82.6
GW-9	2/8/2007	0.0	0.7	19.9	79.4
GW-10	2/8/2007	0.0	7.3	1.4	91.3
GW-11	2/8/2007	0.0	0.2	20.7	79.1
GW-12	2/8/2007	0.0	0.8	19.6	79.6
BH-201	2/8/2007	0.0	0.1	21.1	78.8
BH-501	2/8/2007	0.0	0.1	20.6	79.3
BH-502	2/8/2007	0.0	0.1	20.6	79.3
V-1-1	2/8/2007	23.5	17.7	11.8	47.0
V-2-1	2/8/2007	6.4	3.3	18.5	71.8
V-2-2	2/8/2007	18.6	8.5	15.1	57.8
V-3-1	2/8/2007	5.9	1.7	19.4	73.0
V-4-1	2/8/2007	0.0	0.0	20.8	79.2
V-4-2	2/8/2007	0.0	0.0	20.8	79.2
V-4-3	2/8/2007	0.1	0.2	20.0	79.7
V-4-4	2/8/2007	0.0	0.1	20.8	79.1
V-4-5	2/8/2007	0.0	0.0	20.8	79.2
V-4-6	2/8/2007	0.0	0.0	20.8	79.2
GW-1	5/10/2007	52.8	46.8	0.2	0.2
GW-2	5/10/2007	61.5	38.0	0.2	0.3
GW-3	5/10/2007	46.8	20.0	20.1	13.1
GW-4	5/10/2007	50.2	44.6	0.4	4.8
GW-5	5/10/2007	26.2	6.4	1.6	65.8
GW-6	5/10/2007	64.5	24.9	0.4	10.2
GW-7	5/10/2007	0.0	1.6	18.6	79.8
GW-8	5/10/2007	17.0	7.8	0.4	74.8
GW-9	5/10/2007	0.0	14.4	0.9	84.7
GW-10	5/10/2007	0.0	1.1	18.9	80.0
GW-11	5/10/2007	0.0	4.1	13.3	82.6
GW-12	5/10/2007	0.0	3.0	15.0	82.0
BH-201	5/10/2007	0.0	0.7	20.0	79.3
BH-301	5/10/2007	0.0	0.5	20.4	79.1
BH-501	5/10/2007	0.0	0.8	20.2	79.0
BH-502	5/10/2007	0.0	2.4	17.1	80.5
BH-801	5/10/2007	0.0	1.8	19.0	79.2
BH-802	5/10/2007	0.0	0.4	20.6	79.0
V-1-1	5/10/2007	57.0	42.4	0.1	0.5
V-2-1	5/10/2007	35.0	15.0	9.6	40.4
V-2-2	5/10/2007	33.7	18.4	8.2	39.7
V-3-1	5/10/2007	4.0	1.8	19.2	75.0
V-4-1	5/10/2007	14.6	19.7	6.4	59.3

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
V-4-2	5/10/2007	7.0	4.1	18.2	70.7
V-4-3	5/10/2007	0.3	2.0	16.0	81.7
V-4-4	5/10/2007	0.0	0.4	20.7	78.9
V-4-5	5/10/2007	0.0	2.8	17.2	80.0
V-4-6	5/10/2007	0.0	5.2	16.1	78.7
GW-1	8/8/2007	50.5	45.0	0.0	4.5
GW-2	8/8/2007	41.5	36.6	0.0	21.9
GW-3	8/8/2007	33.0	24.9	5.5	36.6
GW-4	8/8/2007	40.7	41.5	0.0	17.8
GW-5	8/8/2007	8.6	11.2	0.6	79.6
GW-6	8/8/2007	4.6	6.0	14.0	75.4
GW-7	8/8/2007	0.0	2.2	15.7	82.1
GW-8	8/8/2007	0.0	7.2	11.1	81.7
GW-9	8/8/2007	0.0	5.4	12.4	82.2
GW-10	8/8/2007	0.0	3.4	13.6	83.0
GW-11	8/8/2007	0.0	12.0	6.7	81.3
GW-12	8/8/2007	0.0	2.9	14.3	82.8
BH-201	8/8/2007	0.0	4.0	14.5	81.5
BH-301	8/8/2007	4.3	11.1	9.0	75.6
BH-501	8/8/2007	0.0	5.0	11.9	83.1
BH-502	8/8/2007	0.0	1.4	16.8	81.8
V-1-1	8/8/2007	51.8	47.2	0.0	1.0
V-2-1	8/8/2007	1.5	0.7	17.4	80.4
V-2-2	8/8/2007	41.4	28.0	5.5	25.1
V-3-1	8/8/2007	0.7	0.3	18.0	81.0
V-4-1	8/8/2007	0.0	0.0	18.3	81.7
V-4-2	8/8/2007	0.0	0.3	18.0	81.7
V-4-3	8/8/2007	0.0	0.2	18.0	81.8
V-4-4	8/8/2007	0.0	0.3	18.0	81.7
V-4-5	8/8/2007	0.0	13.4	6.4	80.2
V-4-6	8/8/2007	0.0	15.1	4.9	80.0
GW-1	10/31/2007	54.1	45.7	0.1	0.1
GW-2	10/31/2007	58.9	40.9	0.1	0.1
GW-3	10/31/2007	41.6	18.8	2.5	37.1
GW-4	10/31/2007	23.3	18.9	11.3	46.5
GW-5	10/31/2007	23.6	6.1	0.2	70.1
GW-6	10/31/2007	70.6	29.1	0.1	0.2
GW-7	10/31/2007	0.0	3.3	16.1	80.6
GW-8	10/31/2007	9.4	8.9	0.2	81.5
GW-9	10/31/2007	11.5	11.6	0.1	76.8
GW-10	10/31/2007	0.0	1.3	17.9	80.8
GW-11	10/31/2007	0.0	1.4	18.1	80.5
GW-12	10/31/2007	0.0	4.5	15.5	80.0
BH-201	10/31/2007	0.0	0.9	19.1	80.0
BH-301	10/31/2007	42.7	20.2	3.1	34.0
BH-302	10/31/2007	0.0	0.1	20.4	79.5
BH-501	10/31/2007	0.0	1.9	17.1	81.0
BH-502	10/31/2007	0.0	0.5	19.4	80.1
BH-701	10/31/2007	0.0	3.5	16.0	80.5
BH-801	10/31/2007	0.0	2.6	14.1	83.3
BH-802	10/31/2007	0.0	1.0	19.3	79.7
BH-901	10/31/2007	0.0	0.8	18.8	80.4
V-1-1	10/31/2007	54.9	45.0	0.1	0.0
V-2-1	10/31/2007	67.8	30.2	0.6	1.4
V-2-2	10/31/2007	59.3	31.5	1.8	7.4
V-3-1	10/31/2007	19.2	8.5	13.7	58.6
V-4-1	10/31/2007	0.0	0.0	20.4	79.6
V-4-2	10/31/2007	0.0	0.0	20.3	79.7
V-4-3	10/31/2007	0.0	0.0	20.4	79.6
V-4-4	10/31/2007	0.0	0.0	20.3	79.7
V-4-5	10/31/2007	0.0	0.0	20.4	79.6
V-4-6	10/31/2007	0.0	0.0	20.4	79.6

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-1	2/14/2008	55.6	44.2	0.2	0.0
GW-2	2/14/2008	46.9	31.7	3.1	18.3
GW-3	2/14/2008	0.2	0.4	21.6	77.8
GW-4	2/14/2008	58.3	40.6	1.1	0.0
GW-5	2/14/2008	11.5	5.8	1.8	80.9
GW-6	2/14/2008	10.2	4.1	14.1	71.6
GW-7	2/14/2008	0.0	0.4	20.7	78.9
GW-8	2/14/2008	0.0	1.0	20.2	78.8
GW-9	2/14/2008	0.0	1.0	19.4	79.6
GW-10	2/14/2008	NA	NA	NA	NA
GW-11	2/14/2008	0.0	0.8	20.4	78.8
GW-12	2/14/2008	0.2	0.6	17.7	81.5
V-1-1	2/14/2008	20.4	18.7	12.9	48.0
V-2-1	2/14/2008	18.9	10.7	12.5	57.9
V-2-2	2/14/2008	24.8	12.8	14.7	47.7
V-3-1	2/14/2008	0.5	0.5	21.6	77.4
V-4-1	2/14/2008	0.0	0.1	21.4	78.5
V-4-2	2/14/2008	0.2	0.5	20.6	78.7
V-4-3	2/14/2008	0.9	1.5	19.9	77.7
V-4-4	2/14/2008	0.0	0.1	20.3	79.6
V-4-5	2/14/2008	0.0	0.4	20.1	79.5
V-4-6	2/14/2008	0.0	0.1	20.2	79.7
GW-1	5/15/2008	50.1	42.5	0.0	7.4
GW-2	5/15/2008	0.3	0.6	19.3	79.8
GW-3	5/15/2008	5.2	5.6	13.6	75.6
GW-4	5/15/2008	47.8	37.2	0.0	15.0
GW-5	5/15/2008	8.3	4.7	6.1	80.9
GW-6	5/15/2008	0.1	20.0	1.3	78.6
GW-7	5/15/2008	0.1	1.9	17.5	80.5
GW-8	5/15/2008	0.1	2.6	15.2	82.1
GW-9	5/15/2008	0.0	6.1	12.4	81.5
GW-10	5/15/2008	0.0	7.8	7.3	84.9
GW-11	5/15/2008	0.0	8.7	10.1	81.2
GW-12	5/15/2008	0.0	6.3	19.3	74.4
V-1-1	5/15/2008	54.4	43.8	0.0	1.8
V-1-2	5/15/2008	1.1	2.0	18.8	78.1
V-1-3	5/15/2008	0.0	0.0	20.1	79.9
V-1-4	5/15/2008	0.0	0.2	19.9	79.9
V-1-5	5/15/2008	0.1	0.0	20.1	79.8
V-1-6	5/15/2008	0.1	0.0	20.2	79.7
V-2-1	5/15/2008	1.9	3.6	15.9	78.6
V-2-2	5/15/2008	18.1	9.5	13.1	59.3
V-2-10	5/15/2008	0.1	0.0	19.8	80.1
V-3-1	5/15/2008	3.2	1.2	18.8	76.8
V-4-1	5/15/2008	0.0	0.0	20.1	79.9
V-4-2	5/15/2008	0.4	1.3	18.9	79.4
V-4-3	5/15/2008	0.1	0.8	19.3	79.8
V-4-4	5/15/2008	0.0	0.0	20.1	79.9
V-4-5	5/15/2008	0.0	0.0	20.1	79.9
V-4-6	5/15/2008	0.0	0.0	20.0	80.0
BH-201	8/6/2008	0.0	3.4	15.9	80.7
GW-1	8/6/2008	45.5	45.9	0.0	8.6
GW-2	8/6/2008	34.1	35.2	0.0	30.7
GW-3	8/6/2008	0.6	3.5	14.9	81.0
GW-4	8/6/2008	39.0	43.6	0.0	17.4
GW-5	8/6/2008	0.1	4.7	10.9	84.3
GW-6	8/6/2008	0.0	2.2	16.9	80.9
GW-7	8/6/2008	0.1	0.4	18.9	80.6
GW-8	8/6/2008	0.0	8.4	11.7	79.9
GW-9	8/6/2008	0.1	2.8	16.7	80.4
GW-10	8/6/2008	0.0	11.6	5.8	82.6
GW-11	8/6/2008	0.0	12.0	9.5	78.5
GW-12	8/6/2008	0.3	9.2	10.0	80.5

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
V-1-1	8/6/2008	51.4	47.7	0.0	0.9
V-1-2	8/6/2008	2.6	13.2	9.1	75.1
V-1-3	8/6/2008	0.2	0.3	19.7	79.8
V-1-4	8/6/2008	0.4	0.7	19.6	79.3
V-1-5	8/6/2008	0.3	0.9	19.3	79.5
V-1-6	8/6/2008	2.5	16.3	2.9	78.3
V-2-1	8/6/2008	29.7	16.7	8.6	45.0
V-2-2	8/6/2008	37.4	22.7	8.5	31.4
V-2-3	8/6/2008	0.2	0.1	19.6	80.1
V-2-10	8/6/2008	0.6	4.3	15.1	80.0
V-2-18	8/6/2008	0.1	0.4	19.6	79.9
V-3-1	8/6/2008	3.0	1.2	19.0	76.8
V-4-1	8/6/2008	0.0	0.3	19.7	80.0
V-4-2	8/6/2008	0.0	0.7	19.3	80.0
V-4-3	8/6/2008	0.0	0.2	19.7	80.1
V-4-4	8/6/2008	0.3	0.6	16.8	82.3
V-4-5	8/6/2008	0.3	0.4	19.7	79.6
V-4-6	8/6/2008	0.3	3.7	16.3	79.7
GW-1	11/5/2008	55.9	44.1	0.0	0.0
GW-2	11/5/2008	60.5	35.1	0.1	4.3
GW-3	11/5/2008	49.7	20.5	2.4	27.4
GW-4	11/5/2008	56.7	41.1	0.2	2.0
GW-5	11/5/2008	0.0	8.0	4.3	87.7
GW-6	11/5/2008	0.0	4.5	12.9	82.6
GW-7	11/5/2008	0.0	2.6	15.3	82.1
GW-8	11/5/2008	0.0	9.2	6.5	84.3
GW-9	11/5/2008	0.0	0.5	20.5	79.0
GW-10	11/5/2008	0.0	0.4	20.4	79.2
GW-11	11/5/2008	0.0	10.5	6.9	82.6
GW-12	11/5/2008	0.0	6.1	14.4	79.5
BH-201	11/5/2008	0.0	0.7	20.1	79.2
BH-301	11/5/2008	0.0	0.6	20.3	79.1
V-1-1	11/5/2008	55.8	44.2	0.0	0.0
V-1-2	11/5/2008	1.6	4.8	16.1	77.5
V-1-3	11/5/2008	0.0	0.1	20.5	79.4
V-1-4	11/5/2008	0.0	0.0	20.6	79.4
V-1-5	11/5/2008	0.0	0.3	20.3	79.4
V-1-6	11/5/2008	0.0	0.1	20.6	79.3
V-2-1	11/5/2008	50.9	22.1	5.9	21.1
V-2-2	11/5/2008	55.4	28.2	3.3	13.1
V-2-3	11/5/2008	0.1	0.2	20.7	79.0
V-2-10	11/5/2008	1.0	3.5	16.5	79.0
V-2-18	11/5/2008	0.0	0.0	21.0	79.0
V-4-1	11/5/2008	3.5	4.5	16.8	75.2
V-4-2	11/5/2008	4.2	8.8	12.4	74.6
V-4-3	11/5/2008	2.5	6.7	14.0	76.8
V-4-4	11/5/2008	0.0	0.0	21.1	78.9
V-4-5	11/5/2008	0.0	0.0	21.1	78.9
V-4-6	11/5/2008	0.0	0.0	20.8	79.2
GW-1	2/5/2009	56.5	39.5	4.0	0.0
GW-2	2/5/2009	0.1	0.2	19.4	80.3
GW-3	2/5/2009	0.1	0.2	19.7	80.0
GW-4	2/5/2009	0.0	0.2	19.0	80.8
GW-5	2/5/2009	0.1	4.0	11.3	84.6
GW-6	2/5/2009	0.1	0.6	18.4	80.9
GW-7	2/5/2009	0.1	0.3	19.5	80.1
GW-8	2/5/2009	0.1	4.2	16.2	79.5
GW-9	2/5/2009	0.1	1.5	18.4	80.0
GW-10	2/5/2009	0.1	0.2	19.7	80.0
GW-11	2/5/2009	0.1	0.3	18.4	81.2
GW-12	2/5/2009	0.1	0.6	17.6	81.7
V-1-1	2/5/2009	36.2	27.0	11.2	25.6
V-1-2	2/5/2009	1.2	1.9	19.0	77.9

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
V-1-3	2/5/2009	0.1	0.2	19.6	80.1
V-1-4	2/5/2009	0.1	0.2	19.7	80.0
V-1-5	2/5/2009	0.1	0.2	19.6	80.1
V-1-6	2/5/2009	0.1	0.3	19.6	80.0
V-2-1	2/5/2009	13.7	8.5	12.4	65.4
V-2-2	2/5/2009	16.4	9.1	13.0	61.5
V-2-3	2/5/2009	0.1	0.2	19.4	80.3
V-2-10	2/5/2009	0.1	0.2	19.2	80.5
V-2-18	2/5/2009	0.1	0.3	18.4	81.2
V-3-1	2/5/2009	1.9	0.8	16.5	80.8
V-4-1	2/5/2009	3.3	3.1	17.0	76.6
V-4-2	2/5/2009	0.9	1.1	17.9	80.1
V-4-3	2/5/2009	0.8	1.1	17.8	80.3
V-4-4	2/5/2009	0.1	0.2	18.0	81.7
V-4-5	2/5/2009	0.1	0.4	16.8	82.7
V-4-6	2/5/2009	0.1	1.2	17.4	81.3
GW-1	5/21/2009	52.6	46.1	0.4	0.9
GW-2	5/21/2009	48.8	36.5	0.4	14.3
GW-3	5/21/2009	13.5	6.3	10.6	69.6
GW-4	5/21/2009	52.1	46.5	0.5	0.9
GW-5	5/21/2009	0.0	7.5	6.8	85.7
GW-6	5/21/2009	0.0	3.9	11.1	85.0
GW-7	5/21/2009	0.0	1.8	16.7	81.5
GW-8	5/21/2009	0.0	6.1	12.0	81.9
GW-9	5/21/2009	0.0	2.6	16.6	80.8
GW-10	5/21/2009	0.0	7.7	6.9	85.4
GW-11	5/21/2009	0.0	14.0	6.3	79.7
GW-12	5/21/2009	0.0	2.6	15.4	82.0
BH-201	5/21/2009	0.1	0.7	18.5	80.7
BH-301	5/21/2009	0.0	0.2	19.2	80.6
V-1-1	5/21/2009	52.4	42.8	1.4	3.4
V-1-2	5/21/2009	0.0	0.0	19.4	80.6
V-1-3	5/21/2009	0.0	0.0	19.4	80.6
V-1-4	5/21/2009	0.0	0.0	19.3	80.7
V-1-5	5/21/2009	2.1	5.6	14.5	77.8
V-1-6	5/21/2009	0.0	0.0	19.1	80.9
V-2-1	5/21/2009	28.5	13.1	11.1	47.3
V-2-2	5/21/2009	28.0	13.1	11.8	47.1
V-2-3	5/21/2009	0.0	0.0	19.3	80.7
V-2-10	5/21/2009	0.0	0.0	19.6	80.4
V-2-18	5/21/2009	0.0	0.0	19.5	80.5
V-3-1	5/21/2009	3.2	0.9	18.8	77.1
V-4-1	5/21/2009	1.7	5.9	13.6	78.8
V-4-2	5/21/2009	0.0	0.0	19.4	80.6
V-4-3	5/21/2009	0.0	0.2	19.3	80.5
V-4-4	5/21/2009	0.0	0.0	19.6	80.4
V-4-5	5/21/2009	0.0	0.0	19.5	80.5
V-4-6	5/21/2009	0.0	0.0	19.6	80.4
GW-1	8/19/2009	52.6	46.0	0.4	1.0
GW-2	8/19/2009	56.7	39.9	0.5	2.9
GW-3	8/19/2009	46.5	25.5	3.4	24.6
GW-4	8/19/2009	31.3	37.8	0.1	30.8
GW-5	8/19/2009	0.0	10.7	7.7	81.6
GW-6	8/19/2009	0.0	1.6	16.1	82.3
GW-7	8/19/2009	0.0	4.3	13.1	82.6
GW-8	8/19/2009	0.0	6.1	10.8	83.1
GW-9	8/19/2009	0.0	4.2	13.5	82.3
GW-10	8/19/2009	0.0	0.6	17.6	81.8
GW-11	8/19/2009	0.0	5.9	11.8	82.3
GW-12	8/19/2009	0.1	13.4	4.0	82.5
BH-201	8/19/2009	0.0	1.2	17.4	81.4
BH-301	8/19/2009	0.0	1.5	17.8	80.7
V-1-1	8/19/2009	29.3	27.8	8.0	34.9

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
V-1-2	8/19/2009	10.3	11.9	11.3	66.5
V-1-3	8/19/2009	2.2	6.3	13.1	78.4
V-1-4	8/19/2009	0.0	0.1	19.2	80.7
V-1-5	8/19/2009	0.0	0.0	19.3	80.7
V-1-6	8/19/2009	0.0	0.0	19.3	80.7
V-2-1	8/19/2009	22.5	12.0	12.1	53.4
V-2-2	8/19/2009	39.6	23.5	6.9	30.0
V-2-3	8/19/2009	0.3	2.1	16.3	81.3
V-2-10	8/19/2009	0.5	2.7	15.5	81.3
V-2-18	8/19/2009	0.0	0.0	18.9	81.1
V-3-1	8/19/2009	1.9	1.0	18.3	78.8
V-4-1	8/19/2009	0.3	0.4	18.7	80.6
V-4-2	8/19/2009	0.0	0.0	18.9	81.1
V-4-3	8/19/2009	0.3	0.5	18.6	80.6
V-4-4	8/19/2009	0.2	0.4	17.9	81.5
V-4-5	8/19/2009	0.0	0.6	18.6	80.8
V-4-6	8/19/2009	0.3	11.5	8.5	79.7
GW-1	11/12/2009	56.9	43.0	0.1	0.0
GW-2	11/12/2009	56.6	37.8	0.0	5.6
GW-3	11/12/2009	4.5	5.6	11.7	78.2
GW-4	11/12/2009	60.0	39.8	0.2	0.0
GW-5	11/12/2009	0.0	9.3	5.7	85.0
GW-6	11/12/2009	0.0	1.7	17.0	81.3
GW-7	11/12/2009	0.0	3.6	16.3	80.1
GW-8	11/12/2009	0.0	5.4	13.4	81.2
GW-9	11/12/2009	0.0	1.8	18.5	79.7
GW-10	11/12/2009	0.0	3.2	14.0	82.8
GW-11	11/12/2009	0.0	1.4	18.5	80.1
GW-12	11/12/2009	0.0	4.0	16.6	79.4
BH-201	11/12/2009	1.7	5.0	14.6	78.7
V-1-1	11/12/2009	58.0	41.9	0.1	0.0
V-1-2	11/12/2009	0.9	3.3	17.8	78.0
V-1-3	11/12/2009	0.0	0.0	20.7	79.3
V-1-4	11/12/2009	0.0	0.1	20.5	79.4
V-1-5	11/12/2009	0.0	0.5	19.8	79.7
V-1-6	11/12/2009	0.0	0.1	20.4	79.5
V-2-1	11/12/2009	38.9	20.7	5.1	35.3
V-2-2	11/12/2009	43.6	21.8	7.0	27.6
V-2-3	11/12/2009	0.0	0.1	20.6	79.3
V-2-10	11/12/2009	0.7	0.7	19.7	78.9
V-2-18	11/12/2009	0.0	0.1	20.6	79.3
V-3-1	11/12/2009	1.6	0.7	20.0	77.7
V-4-1	11/12/2009	2.1	1.4	19.7	76.8
V-4-2	11/12/2009	0.0	0.1	20.6	79.3
V-4-3	11/12/2009	0.3	1.4	19.1	79.2
V-4-4	11/12/2009	0.0	0.1	20.6	79.3
V-4-5	11/12/2009	0.0	0.6	20.0	79.4
V-4-6	11/12/2009	0.0	0.1	20.5	79.4
GW-1	2/19/2010	0.7	0.9	20.3	78.1
GW-2	2/19/2010	0.0	0.2	20.6	79.2
GW-3	2/19/2010	44.9	15.9	0.0	39.2
GW-4	2/19/2010	45.5	38.1	0.6	15.8
GW-5	2/19/2010	0.0	0.2	19.4	80.4
GW-6	2/19/2010	0.0	0.0	20.2	79.8
GW-7	2/19/2010	0.0	0.0	20.5	79.5
GW-8	2/19/2010	0.0	0.5	19.0	80.5
GW-9	2/19/2010	0.0	0.8	19.8	79.4
GW-10	2/19/2010	0.0	0.0	20.1	79.9
GW-11	2/19/2010	0.0	0.0	20.4	79.6
GW-12	2/19/2010	0.0	0.0	20.6	79.4
BH-301	2/19/2010	0.0	0.0	20.3	79.7
V-1-1	2/19/2010	22.4	17.4	12.4	47.8
V-1-2	2/19/2010	0.3	1.3	18.8	79.6

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
V-1-3	2/19/2010	0.0	0.0	20.4	79.6
V-1-4	2/19/2010	0.0	0.0	20.5	79.5
V-1-5	2/19/2010	0.0	0.0	20.6	79.4
V-1-6	2/19/2010	0.0	0.0	20.6	79.4
V-2-1	2/19/2010	0.0	0.0	20.9	79.1
V-2-2	2/19/2010	0.0	0.0	19.8	80.2
V-2-3	2/19/2010	0.0	0.0	21.0	79.0
V-2-10	2/19/2010	0.0	0.0	21.0	79.0
V-2-18	2/19/2010	0.0	0.0	21.0	79.0
V-3-1	2/19/2010	0.0	0.0	21.0	79.0
V-4-1	2/19/2010	0.4	0.7	19.8	79.1
V-4-2	2/19/2010	0.0	0.0	20.6	79.4
V-4-3	2/19/2010	0.0	0.0	20.4	79.6
V-4-4	2/19/2010	0.0	0.0	20.6	79.4
V-4-5	2/19/2010	0.0	0.0	20.6	79.4
V-4-6	2/19/2010	0.0	0.0	19.4	80.6
GW-1	5/27/2010	52.4	47.4	0.2	0.0
GW-2	5/27/2010	57.2	42.5	0.3	0.0
GW-3	5/27/2010	47.7	22.1	4.8	25.4
GW-4	5/27/2010	31.8	34.0	0.1	34.1
GW-5	5/27/2010	0.1	1.0	17.3	81.6
GW-6	5/27/2010	0.3	0.6	19.7	79.4
GW-7	5/27/2010	0.1	1.7	15.3	82.9
GW-8	5/27/2010	0.1	4.3	13.2	82.4
GW-9	5/27/2010	0.0	1.8	17.8	80.4
GW-10	5/27/2010	0.0	0.4	20.1	79.5
GW-11	5/27/2010	41.3	24.2	0.0	34.5
GW-12	5/27/2010	0.0	1.4	17.7	80.9
BH-1101	5/27/2010	0.8	1.5	18.7	79.0
BH-1102	5/27/2010	51.2	42.6	4.2	2.0
BH-1103	5/27/2010	50.1	45.3	4.4	0.2
BH-1104	5/27/2010	28.2	19.2	8.2	44.4
BH-1105	5/27/2010	0.4	3.9	12.7	83.0
BH-1106	5/27/2010	42.2	49.5	2.4	5.9
BH-1107	5/27/2010	0.1	1.5	16.9	81.5
BH-1108	5/27/2010	51.7	47.7	0.6	0.0
BH-1109	5/27/2010	46.2	17.2	0.5	36.1
BH-1110	5/27/2010	0.2	0.6	9.9	89.3
BH-1111	5/27/2010	49.3	50.2	0.5	0.0
BH-1112	5/27/2010	2.1	11.6	9.4	76.9
BH-1113	5/27/2010	47.4	46.3	0.3	6.0
BH-1114	5/27/2010	0.0	4.7	15.3	80.0
V-1-1	5/27/2010	53.2	46.7	0.1	0.0
V-1-2	5/27/2010	12.0	13.4	12.9	61.7
V-1-3	5/27/2010	2.8	0.2	20.5	76.5
V-1-4	5/27/2010	0.1	0.1	20.6	79.2
V-1-5	5/27/2010	0.1	0.6	19.9	79.4
V-1-6	5/27/2010	0.1	0.0	20.7	79.2
V-2-1	5/27/2010	45.6	24.2	6.9	23.3
V-2-2	5/27/2010	34.2	17.6	9.5	38.7
V-2-3	5/27/2010	5.8	15.0	4.1	75.1
V-2-10	5/27/2010	3.4	7.7	15.5	73.4
V-2-18	5/27/2010	0.3	1.3	19.9	78.5
V-3-1	5/27/2010	2.8	1.0	19.7	76.5
V-4-1	5/27/2010	15.0	6.4	12.4	66.2
V-4-2	5/27/2010	0.0	0.3	20.2	79.5
V-4-3	5/27/2010	0.3	1.2	19.6	78.9
V-4-4	5/27/2010	0.6	1.9	19.6	77.9
V-4-5	5/27/2010	0.4	0.4	19.9	79.3
V-4-6	5/27/2010	0.6	3.0	15.3	81.1
GW-1	8/26/2010	50.5	49.5	0.0	0.0
GW-2	8/26/2010	26.5	26.5	5.5	41.5
GW-3	8/26/2010	39.3	25.4	2.2	33.1

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-4	8/26/2010	38.8	46.2	0.0	15.0
GW-5	8/26/2010	0.2	2.4	17.0	80.4
GW-6	8/26/2010	0.2	0.9	19.6	79.3
GW-7	8/26/2010	0.3	0.9	19.7	79.1
GW-8	8/26/2010	0.2	8.8	13.9	77.1
GW-9	8/26/2010	0.3	2.2	18.7	78.8
GW-10	8/26/2010	0.2	1.1	18.6	80.1
GW-11	8/26/2010	0.2	20.3	2.5	77.0
GW-12	8/26/2010	0.3	0.3	20.3	79.1
BH-201	8/26/2010	3.4	2.7	18.0	75.9
BH-301	8/26/2010	0.2	0.9	19.0	79.9
V-1-1	8/26/2010	29.9	29.6	6.3	34.2
V-1-2	8/26/2010	0.1	0.2	20.2	79.5
V-1-3	8/26/2010	1.2	4.2	16.6	78.0
V-1-4	8/26/2010	0.2	0.5	20.0	79.3
V-1-5	8/26/2010	0.1	0.2	20.2	79.5
V-1-6	8/26/2010	0.0	0.1	20.2	79.7
V-2-1	8/26/2010	1.8	1.2	19.4	77.6
V-2-2	8/26/2010	18.8	11.3	14.0	55.9
V-2-3	8/26/2010	0.2	0.0	20.5	79.3
V-2-10	8/26/2010	0.2	0.0	20.4	79.4
V-2-18	8/26/2010	0.2	0.2	20.2	79.4
V-3-1	8/26/2010	0.3	0.1	20.4	79.2
V-4-1	8/26/2010	0.7	11.3	19.5	68.5
V-4-2	8/26/2010	0.2	0.4	20.4	79.0
V-4-3	8/26/2010	0.2	1.3	18.2	80.3
V-4-4	8/26/2010	0.2	0.0	20.6	79.2
V-4-5	8/26/2010	0.2	0.1	20.5	79.2
V-4-6	8/26/2010	0.3	0.0	20.5	79.2
GW-1	11/19/2010	48.7	41.1	1.5	8.7
GW-2	11/19/2010	46.2	36.1	0.0	17.7
GW-3	11/19/2010	0.0	8.7	11.2	80.1
GW-4	11/19/2010	34.8	35.6	0.0	29.6
GW-5	11/19/2010	0.0	11.3	6.9	81.8
GW-6	11/19/2010	0.0	3.8	15.5	80.7
GW-7	11/19/2010	0.0	2.4	18.2	79.4
GW-8	11/19/2010	0.0	7.1	14.2	78.7
GW-9	11/19/2010	0.0	1.8	18.9	79.3
GW-10	11/19/2010	0.0	0.3	19.7	80.0
GW-11	11/19/2010	0.0	9.5	9.0	81.5
GW-12	11/19/2010	0.0	0.0	20.0	80.0
BH-201	11/19/2010	0.0	1.5	18.7	79.8
V-1-1	11/19/2010	53.0	42.2	1.3	3.5
V-1-2	11/19/2010	1.0	1.2	17.3	80.5
V-1-3	11/19/2010	0.0	0.0	20.1	79.9
V-1-4	11/19/2010	0.0	0.0	20.1	79.9
V-1-5	11/19/2010	0.0	0.0	20.0	80.0
V-1-6	11/19/2010	0.0	0.0	20.0	80.0
V-2-1	11/19/2010	21.7	16.9	3.8	57.6
V-2-2	11/19/2010	37.5	18.4	9.3	34.8
V-2-3	11/19/2010	0.0	0.0	20.0	80.0
V-2-10	11/19/2010	0.0	0.0	20.0	80.0
V-2-18	11/19/2010	0.0	0.0	20.0	80.0
V-3-1	11/19/2010	2.8	1.0	19.2	77.0
V-4-1	11/19/2010	0.0	0.9	19.2	79.9
V-4-2	11/19/2010	0.0	0.3	19.5	80.2
V-4-3	11/19/2010	0.0	0.5	19.3	80.2
V-4-4	11/19/2010	0.0	0.0	20.0	80.0
V-4-5	11/19/2010	0.0	0.6	19.9	79.5
V-4-6	11/19/2010	0.0	0.0	20.1	79.9
GW-1	2/28/2011	56.5	43.3	0.0	0.2
GW-2	2/28/2011	0.0	0.3	19.3	80.4
GW-3	2/28/2011	6.4	4.2	14.4	75.0

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-4	2/28/2011	1.5	2.5	17.6	78.4
GW-5	2/28/2011	0.0	0.2	19.3	80.5
GW-6	2/28/2011	0.0	0.0	19.7	80.3
GW-7	2/28/2011	0.0	1.6	17.2	81.2
GW-8	2/28/2011	0.0	0.9	17.8	81.3
GW-9	2/28/2011	0.0	0.0	19.3	80.7
GW-10	2/28/2011	0.0	0.0	19.2	80.8
GW-11	2/28/2011	11.0	5.0	0.6	83.4
GW-12	2/28/2011	0.0	0.0	19.8	80.2
V-1-1	2/28/2011	0.5	0.5	19.8	79.2
V-1-2	2/28/2011	0.1	0.5	20.3	79.1
V-1-3	2/28/2011	0.0	0.0	20.8	79.2
V-1-4	2/28/2011	0.0	0.0	20.8	79.2
V-1-5	2/28/2011	0.0	0.0	20.9	79.1
V-1-6	2/28/2011	0.0	0.0	20.9	79.1
V-2-1	2/28/2011	0.0	0.0	20.3	79.7
V-2-2	2/28/2011	0.0	0.0	20.0	80.0
V-2-3	2/28/2011	0.0	0.0	20.5	79.5
V-2-10	2/28/2011	0.0	0.0	20.6	79.4
V-2-18	2/28/2011	0.0	0.0	20.6	79.4
V-3-1	2/28/2011	0.0	0.0	20.1	79.9
V-4-1	2/28/2011	0.0	0.0	19.6	80.4
V-4-2	2/28/2011	0.0	0.0	19.8	80.2
V-4-3	2/28/2011	0.0	0.3	19.7	80.0
V-4-4	2/28/2011	0.0	0.0	19.8	80.2
V-4-5	2/28/2011	0.0	0.0	19.9	80.1
V-4-6	2/28/2011	0.0	0.0	19.9	80.1
GW-1	5/12/2011	47.6	48.7	0.1	3.6
GW-2	5/12/2011	48.7	35.1	0.0	16.2
GW-3	5/12/2011	0.1	5.2	12.9	81.8
GW-4	5/12/2011	56.8	43.1	0.0	0.1
GW-5	5/12/2011	0.0	8.1	10.0	81.9
GW-6	5/12/2011	0.0	1.4	19.4	79.2
GW-7	5/12/2011	0.0	2.3	18.2	79.5
GW-8	5/12/2011	0.0	2.6	17.0	80.4
GW-9	5/12/2011	0.0	2.2	18.3	79.5
GW-10	5/12/2011	0.0	0.2	20.7	79.1
GW-11	5/12/2011	0.0	8.1	12.6	79.3
GW-12	5/12/2011	0.1	0.0	20.7	79.2
BH-101	5/12/2011	0.0	0.4	20.2	79.4
BH-201	5/12/2011	11.6	7.1	13.8	67.5
BH-202	5/12/2011	0.0	0.1	20.8	79.1
V-1-1	5/12/2011	49.3	50.7	0.0	0.0
V-1-2	5/12/2011	0.0	0.0	20.9	79.1
V-1-3	5/12/2011	0.0	1.7	19.0	79.3
V-1-4	5/12/2011	0.0	0.0	21.0	79.0
V-1-5	5/12/2011	0.0	0.0	21.0	79.0
V-1-6	5/12/2011	0.0	0.0	21.0	79.0
V-2-1	5/12/2011	25.5	13.4	11.2	49.9
V-2-2	5/12/2011	36.4	20.3	8.7	34.6
V-2-3	5/12/2011	1.1	4.3	15.4	79.2
V-2-10	5/12/2011	0.7	1.8	17.2	80.3
V-2-18	5/12/2011	0.4	0.6	19.8	79.2
V-3-1	5/12/2011	0.9	0.3	20.5	78.3
V-4-1	5/12/2011	0.0	0.0	20.5	79.5
V-4-2	5/12/2011	0.2	0.1	20.8	78.9
V-4-3	5/12/2011	1.8	1.4	20.1	76.7
V-4-4	5/12/2011	0.1	0.2	20.5	79.2
V-4-5	5/12/2011	0.1	1.9	18.4	79.6
V-4-6	5/12/2011	0.1	2.5	18.1	79.3
GW-1	8/18/2011	52.9	46.7	0.4	0.0
GW-2	8/18/2011	54.8	44.9	0.1	0.2
GW-3	8/18/2011	28.2	19.3	5.4	47.1

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-4	8/18/2011	47.9	46.3	1.1	4.7
GW-5	8/18/2011	0.0	17.1	5.0	77.9
GW-6	8/18/2011	0.0	0.5	22.1	77.4
GW-7	8/18/2011	0.0	2.0	22.1	75.9
GW-8	8/18/2011	0.0	1.4	21.3	77.3
GW-9	8/18/2011	0.0	2.4	21.2	76.4
GW-10	8/18/2011	0.0	0.4	22.9	76.7
GW-11	8/18/2011	6.5	24.7	0.3	68.5
GW-12	8/18/2011	0.0	11.8	10.3	77.9
BH-201	8/18/2011	3.0	14.5	6.5	76.0
BH-1101	8/18/2011	0.0	0.5	22.9	76.6
BH-V-4-1-1	8/18/2011	0.0	11.6	11.7	76.7
BH-V-4-1-2	8/18/2011	46.8	41.8	3.2	8.2
BH-V-4-1-3	8/18/2011	22.4	20.8	12.6	44.2
BH-V-4-1-4	8/18/2011	28.1	23.7	10.4	37.8
BH-V-4-1-5	8/18/2011	0.0	8.7	21.1	70.2
BH-V-4-1-6	8/18/2011	30.9	36.0	6.4	26.7
BH-V-4-1-7	8/18/2011	1.4	15.3	10.3	73.0
BH-V-4-1-8	8/18/2011	0.0	1.6	21.7	76.7
BH-V-4-1-9	8/18/2011	0.0	7.4	16.2	76.4
V-1-1	8/18/2011	49.6	50.1	0.2	0.1
V-1-2	8/18/2011	0.1	0.2	21.2	78.5
V-1-3	8/18/2011	19.6	6.8	14.6	59.0
V-1-4	8/18/2011	0.4	0.2	21.0	78.4
V-1-5	8/18/2011	0.2	1.1	19.3	79.4
V-1-6	8/18/2011	0.0	0.5	20.2	79.3
V-2-1	8/18/2011	26.3	13.1	14.3	46.3
V-2-2	8/18/2011	--	--	--	--
V-2-10	8/18/2011	0.5	2.6	17.6	79.3
V-2-18	8/18/2011	0.0	0.9	20.0	79.1
V-2-3	8/18/2011	0.0	0.0	21.5	78.5
V-3-1	8/18/2011	1.1	0.5	21.4	77.0
V-4-1	8/18/2011	19.9	27.9	2.6	49.6
V-4-2	8/18/2011	0.0	0.0	22.8	77.2
V-4-3	8/18/2011	0.0	0.2	22.5	77.3
V-4-4	8/18/2011	0.0	0.4	22.1	77.5
V-4-5	8/18/2011	0.0	1.0	19.0	80.0
V-4-6	8/18/2011	0.0	4.9	17.3	77.8
GW-1	11/17/2011	61.0	37.7	0.9	0.4
GW-2	11/17/2011	36.7	33.9	0.1	29.3
GW-3	11/17/2011	1.1	1.6	15.8	81.5
GW-4	11/17/2011	62.8	34.8	2.4	0.0
GW-5	11/17/2011	0.0	13.2	7.1	79.7
GW-6	11/17/2011	0.0	0.1	18.0	81.9
GW-7	11/17/2011	0.0	1.3	17.1	81.6
GW-8	11/17/2011	0.0	11.4	8.8	79.8
GW-9	11/17/2011	0.0	1.2	17.0	81.8
GW-10	11/17/2011	0.0	2.4	14.8	82.8
GW-11	11/17/2011	0.0	15.4	4.5	80.1
GW-12	11/17/2011	0.0	0.0	20.1	79.9
GW-13	11/17/2011	60.1	39.3	0.3	0.3
GW-14	11/17/2011	2.8	3.7	5.6	87.9
GW-15	11/17/2011	0.0	1.3	16.1	82.6
GW-16	11/17/2011	0.0	0.5	17.5	82.0
GW-17	11/17/2011	0.0	1.6	16.5	81.9
BH-201	11/17/2011	0.0	3.1	16.7	80.2
BH-1301	11/17/2011	0.0	0.0	17.9	82.1
V-1-1	11/17/2011	41.4	30.2	7.1	21.3
V-1-2	11/17/2011	1.2	2.6	17.2	79.0
V-1-3	11/17/2011	0.0	0.0	19.1	80.9
V-1-4	11/17/2011	0.0	0.0	19.1	80.9
V-1-5	11/17/2011	0.0	0.0	19.1	80.9
V-1-6	11/17/2011	0.0	0.0	18.4	81.6

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
V-2-1	11/17/2011	0.0	0.0	18.8	81.2
V-2-2	11/17/2011	11.3	5.5	15.9	67.3
V-2-3	11/17/2011	0.0	0.0	19.0	81.0
V-2-10	11/17/2011	0.0	0.0	19.0	81.0
V-2-18	11/17/2011	0.0	0.0	18.8	81.2
V-3-1	11/17/2011	0.0	0.0	18.9	81.1
V-4-1	11/17/2011	0.5	0.5	19.8	79.2
V-4-2	11/17/2011	1.1	1.5	18.6	78.8
V-4-3	11/17/2011	0.1	1.0	19.1	79.8
V-4-4	11/17/2011	0.0	0.1	19.9	80.0
V-4-5	11/17/2011	0.0	0.0	20.2	79.8
V-4-6	11/17/2011	0.0	0.0	20.2	79.8
GW-1	2/16/2012	59.1	42.9	0.4	0.0
GW-2	2/16/2012	8.5	7.4	16.8	67.3
GW-3	2/16/2012	0.1	0.7	19.8	79.4
GW-4	2/16/2012	63.7	34.0	0.8	1.5
GW-5	2/16/2012	0.0	9.3	7.2	83.5
GW-6	2/16/2012	0.0	0.4	21.2	78.4
GW-7	2/16/2012	0.0	2.1	18.7	79.2
GW-8	2/16/2012	0.0	5.2	15.8	79.0
GW-9	2/16/2012	0.0	1.5	19.2	79.3
GW-10	2/16/2012	0.0	6.7	7.4	85.9
GW-11	2/16/2012	0.0	7.0	12.7	80.3
GW-12	2/16/2012	0.0	0.1	21.5	78.4
GW-13	2/16/2012	54.9	43.7	0.7	0.7
GW-14	2/16/2012	1.3	3.9	14.4	80.4
GW-15	2/16/2012	0.0	3.3	17.0	79.7
GW-16	2/16/2012	0.0	1.4	19.8	78.8
GW-17	2/16/2012	0.0	0.5	20.8	78.7
BH-201	2/16/2012	0.0	0.1	21.3	78.6
BH-1301	2/16/2012	0.0	0.6	21.2	78.2
BH-1302	2/16/2012	13.1	10.7	16.8	59.4
BH-1303	2/16/2012	0.0	0.2	21.4	78.4
V-1-1	2/16/2012	6.4	4.9	19.7	69.0
V-1-2	2/16/2012	1.4	1.9	21.0	75.7
V-1-3	2/16/2012	0.1	0.1	21.0	78.8
V-1-4	2/16/2012	0.0	0.1	21.9	78.0
V-1-5	2/16/2012	0.0	0.1	21.9	78.0
V-1-6	2/16/2012	0.0	0.1	21.9	78.0
V-2-1	2/16/2012	1.5	0.9	20.9	76.7
V-2-2	2/16/2012	15.0	7.5	17.0	60.5
V-2-3	2/16/2012	0.0	0.1	21.6	78.3
V-2-10	2/16/2012	0.0	0.1	21.7	78.2
V-2-18	2/16/2012	0.1	0.1	21.8	78.0
V-3-1	2/16/2012	0.0	0.1	21.5	78.4
V-4-1	2/16/2012	1.2	1.3	20.1	77.4
V-4-2	2/16/2012	0.6	0.8	20.5	78.1
V-4-3	2/16/2012	0.5	0.6	20.7	78.2
V-4-4	2/16/2012	0.0	0.1	21.5	78.4
V-4-5	2/16/2012	0.0	0.2	21.3	78.5
V-4-6	2/16/2012	0.1	0.1	21.2	78.6
GW-1	6/7/2012	47.6	45.9	0.0	6.5
GW-2	6/7/2012	41.5	38.5	0.0	20.0
GW-3	6/7/2012	40.2	20.2	0.0	39.6
GW-4	6/7/2012	33.3	40.6	0.3	25.8
GW-5	6/7/2012	0.3	10.8	10.3	78.6
GW-6	6/7/2012	0.3	4.5	16.9	78.3
GW-7	6/7/2012	0.2	2.6	18.0	79.2
GW-8	6/7/2012	0.3	6.9	15.3	77.5
GW-9	6/7/2012	0.3	3.2	18.5	78.0
GW-10	6/7/2012	0.0	8.6	14.7	76.6
GW-11	6/7/2012	0.2	13.3	9.3	77.2
GW-12	6/7/2012	0.2	4.4	16.5	78.9

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-13	6/7/2012	48.5	49.6	0.0	1.9
GW-14	6/7/2012	5.1	8.4	4.2	82.3
GW-15	6/7/2012	0.2	5.8	15.1	78.9
GW-16	6/7/2012	0.3	4.3	17.1	78.3
GW-17	6/7/2012	0.0	0.7	20.5	78.8
BH-3-01	6/7/2012	0.6	1.5	19.6	78.3
BH-13-01	6/7/2012	29.2	26.7	4.8	39.3
BH-13-02	6/7/2012	0.3	0.4	20.5	78.8
BH-13-03	6/7/2012	23.8	21.1	9.7	45.4
BH-13-04	6/7/2012	0.2	0.1	20.9	78.8
BH-13-05	6/7/2012	14.1	4.8	15.8	65.3
BH-13-06	6/7/2012	0.5	1.5	20.3	77.7
BH-13-07	6/7/2012	0.3	0.6	20.3	78.8
BH-13-08	6/7/2012	0.3	1.1	20.3	78.3
BH-14-01	6/7/2012	0.0	0.6	19.9	79.5
V-1-1	6/7/2012	29.0	25.1	9.5	36.4
V-1-2	6/7/2012	0.0	0.1	20.4	79.5
V-1-3	6/7/2012	0.2	0.5	20.2	79.1
V-1-4	6/7/2012	0.0	0.4	20.3	79.3
V-1-5	6/7/2012	0.3	3.3	16.7	79.7
V-1-6	6/7/2012	0.0	0.3	20.3	79.4
V-2-1	6/7/2012	5.8	2.6	18.7	72.9
V-2-2	6/7/2012	15.8	7.7	16.7	59.8
V-2-3	6/7/2012	0.0	0.5	20.1	79.4
V-2-10	6/7/2012	0.1	0.6	20.0	79.3
V-2-18	6/7/2012	0.0	1.1	19.4	79.5
V-3-1	6/7/2012	0.1	0.0	20.6	79.3
V-4-1	6/7/2012	0.4	0.5	20.5	78.6
V-4-2	6/7/2012	0.3	3.1	18.7	77.9
V-4-3	6/7/2012	0.1	3.2	18.3	78.4
V-4-4	6/7/2012	0.1	0.2	20.7	79.0
V-4-5	6/7/2012	0.2	0.0	20.9	78.9
V-4-6	6/7/2012	0.2	0.1	20.9	78.8
GW-1	8/23/2012	54.2	45.6	0.0	6.5
GW-2	8/23/2012	52.9	45.2	0.1	20.0
GW-3	8/23/2012	25.2	31.5	0.1	39.6
GW-4	8/23/2012	45.9	45.8	0.0	25.8
GW-5	8/23/2012	0.4	13.5	9.6	78.6
GW-6	8/23/2012	0.3	7.7	14.4	78.3
GW-7	8/23/2012	0.3	5.0	16.4	79.2
GW-8	8/23/2012	0.4	14.4	9.5	77.5
GW-9	8/23/2012	0.4	3.8	17.7	78.0
GW-10	8/23/2012	0.3	13.9	4.4	76.6
GW-11	8/23/2012	0.1	5.2	14.2	77.2
GW-12	8/23/2012	0.0	10.1	10.5	78.9
GW-13	8/23/2012	51.8	48.0	0.0	1.9
GW-14	8/23/2012	19.6	13.2	0.9	82.3
GW-15	8/23/2012	0.4	7.4	12.5	78.9
GW-16	9/6/2012	0.1	4.9	17.2	78.3
GW-17	9/6/2012	0.1	3.9	19.7	78.8
BH-2-01	8/23/2012	0.2	1.4	19.8	78.3
BH-13-01	8/23/2012	25.6	21.3	6.4	39.3
BH-13-02	8/23/2012	0.2	0.7	20.0	78.8
BH-13-03	8/23/2012	44.6	33.7	3.0	45.4
BH-13-04	8/23/2012	0.1	0.4	20.2	78.8
BH-13-05	8/23/2012	9.0	6.5	15.1	65.3
BH-13-06	8/23/2012	0.2	0.1	20.3	77.7
BH-13-07	8/23/2012	0.2	0.3	20.2	78.8
BH-13-08	8/23/2012	0.1	0.1	20.4	78.3
BH-14-01	8/23/2012	0.3	1.9	19.4	79.5
V-1-1	8/23/2012	44.4	34.9	9.6	36.4
V-1-2	8/23/2012	1.6	1.1	20.6	79.5
V-1-3	8/23/2012	0.2	0.0	21.4	79.1

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
V-1-4	8/23/2012	15.1	13.6	12.0	79.3
V-1-5	8/23/2012	0.4	0.1	21.1	79.7
V-1-6	8/23/2012	4.2	7.5	16.0	79.4
V-2-1	8/23/2012	19.8	11.1	14.5	72.9
V-2-2	8/23/2012	8.5	4.3	19.1	59.8
V-2-3	8/23/2012	0.2	0.0	21.4	79.4
V-2-10	8/23/2012	0.5	0.3	21.1	79.3
V-2-18	8/23/2012	0.4	0.0	21.2	79.5
V-3-1	9/6/2012	0.5	0.1	20.9	79.3
V-4-1	8/23/2012	0.2	0.2	20.3	78.6
V-4-2	8/23/2012	0.2	0.2	20.2	77.9
V-4-3	8/23/2012	0.1	0.1	20.4	78.4
V-4-4	8/23/2012	0.0	0.5	19.9	79.0
V-4-5	8/23/2012	0.0	0.2	20.4	78.9
V-4-6	8/23/2012	0.0	0.5	20.4	78.8
GW-1	11/8/2012	57.3	42.5	0	0.2
GW-2	11/8/2012	49.6	39	0	11.4
GW-3	11/8/2012	22	18.5	0.8	58.7
GW-4	11/8/2012	60.4	38.9	0	0.7
GW-5	11/8/2012	0	11.4	8.4	80.2
GW-6	11/8/2012	0	4.7	16	79.3
GW-7	11/8/2012	0	2.7	17.8	79.5
GW-8	11/8/2012	0	11.2	9.3	79.5
GW-9	11/8/2012	0	3	17.1	79.9
GW-10	11/8/2012	0	10.9	8.1	81
GW-11	11/8/2012	0	10.1	9.8	80.1
GW-12	11/8/2012	0	4.2	15.8	80
GW-13	11/8/2012	58	40.7	0.7	0.6
GW-14	11/8/2012	15.7	7.8	1.2	75.3
GW-15	11/8/2012	0	7.3	11.4	81.3
GW-16	11/8/2012	0	5.2	16	78.8
GW-17	11/8/2012	0	5.3	15.9	78.8
BH-2-01	11/8/2012	0	3	15.9	81.1
BH-13-01	11/8/2012	60	38.6	1.4	0
BH-13-02	11/8/2012	0	1.2	12.9	85.9
BH-13-03	11/8/2012	20.8	19	6	54.2
BH-13-04	11/8/2012	0	3.6	16.2	80.2
BH-13-05	11/8/2012	0	0.7	19.5	79.8
BH-14-01	11/8/2012	0	0.5	19.3	80.2
V-1-1	11/8/2012	38.8	33.5	5.3	22.4
V-1-2	11/8/2012	0.7	2.7	18.2	78.4
V-1-3	11/8/2012	0	0.1	20.6	79.3
V-1-4	11/8/2012	0	0.1	20.7	79.2
V-1-5	11/8/2012	0	0.1	20.6	79.3
V-1-6	11/8/2012	0	0.3	20.5	79.2
V-2-1	11/8/2012	0	0.1	20.2	79.7
V-2-2	11/8/2012	4.7	2.4	18	74.9
V-2-3	11/8/2012	0	0.1	20.6	79.3
V-2-10	11/8/2012	0	0.1	20.6	79.3
V-2-18	11/8/2012	0	0.1	20.6	79.3
V-3-1	11/8/2012	0	0.1	20.2	79.7
V-4-1	11/8/2012	0.4	0.5	20.1	79
V-4-2	11/8/2012	0	0.1	20.3	79.6
V-4-3	11/8/2012	0	0.8	19.6	79.6
V-4-4	11/8/2012	0	0.1	20.2	79.7
V-4-5	11/8/2012	0	0.5	19.8	79.7
V-4-6	11/8/2012	0	0.1	19.8	80.1
Storage Shed	11/8/2012	0	0	20.7	79.3
GW-1	2/21/2013	53.5	41.7	0.1	4.7
GW-2	2/21/2013	26.1	21.7	0.0	52.2
GW-3	2/21/2013	19.0	7.5	1.5	72.0
GW-4	2/21/2013	60.0	37.0	0.0	3.0
GW-5	2/21/2013	0.1	7.4	10.7	81.8

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

Sample Location	Date	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Balance Nitrogen (%)
GW-6	2/21/2013	0.1	2.7	18.7	78.5
GW-7	2/21/2013	0.1	1.7	20.7	77.5
GW-8	2/21/2013	0.1	5.7	13.4	80.8
GW-9	2/21/2013	0.2	1.5	20.7	77.6
GW-10 ¹²	2/21/2013	--	--	--	--
GW-11	2/21/2013	0.1	0.5	21.9	77.5
GW-12	2/21/2013	0.2	2.0	20.2	77.6
GW-13	2/21/2013	56.5	42.6	0.8	0.1
GW-14	2/21/2013	14.3	2.9	3.3	79.5
GW-15	2/21/2013	0.1	5.0	15.4	79.5
GW-16	2/21/2013	0.1	3.1	19.4	77.4
GW-17	2/21/2013	0.1	4.4	16.9	78.6
BH-14-01	2/21/2013	0.1	0.1	22.1	77.7
Storage Shed	2/21/2013	0.0	0.1	16.9	83.0
GW-1	5/31/2013	50.0	50.0	0.0	0.0
GW-2	5/31/2013	51.5	41.8	0.0	6.7
GW-3	5/31/2013	20.2	14.3	0.0	65.5
GW-4	5/31/2013	45.9	48.5	0.8	4.8
GW-5	5/31/2013	0.1	1.7	13.0	85.2
GW-6	5/31/2013	0.1	0.8	15.4	83.7
GW-7	5/31/2013	0.1	3.5	17.0	79.4
GW-8	5/31/2013	0.1	9.8	11.0	79.1
GW-9	5/31/2013	0.1	3.9	15.2	80.8
GW-10	5/31/2013	0.1	9.9	6.3	83.7
GW-11	5/31/2013	0.8	19.2	0.0	80.0
GW-12	5/31/2013	0.0	6.1	11.5	82.4
GW-13 ¹¹	5/31/2013	48.8	51.5	0.0	(0.3)
GW-14	5/31/2013	10.0	2.2	4.9	82.9
GW-15	5/31/2013	0.0	5.8	14.6	79.6
GW-15A	5/31/2013	3.2	13.6	0.8	82.4
GW-16	5/31/2013	0.0	2.6	15.8	81.6
GW-17	5/31/2013	0.1	1.4	18.0	80.5
GW-18	5/31/2013	21.4	3.7	0.2	74.7
GW-19	5/31/2013	43.3	43.9	1.1	11.7
GW-20	5/31/2013	0.1	8.1	10.9	80.9
GW-21	5/31/2013	0.2	2.6	12.6	84.6
Storage Shed	5/31/2013	0.2	0.0	21.0	78.8
Manhole #11	5/31/2013	0.1	0.9	19.7	79.3
Manhole #12	5/31/2013	0.0	0.9	19.4	79.7
Manhole #14	5/31/2013	0.1	0.9	19.8	79.2
Manhole #15	5/31/2013	0.3	1.1	19.7	78.9

See Notes on Page 22.

Georgia-Pacific, LLC
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
King Highway Landfill Operable Unit 3
Landfill Gas Monitoring Program

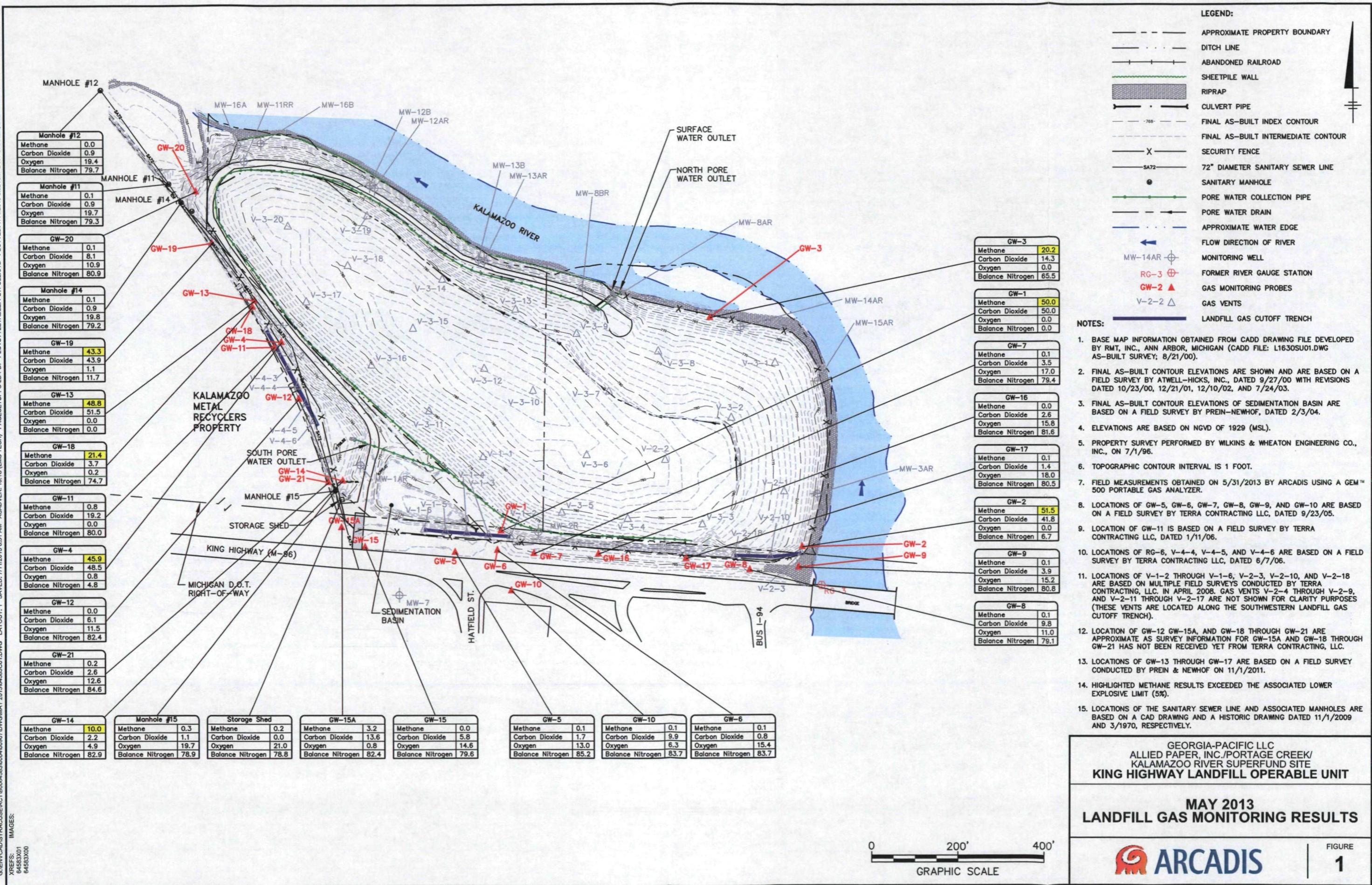
Table 2 - Summary of Post-Closure Landfill Gas Monitoring Results

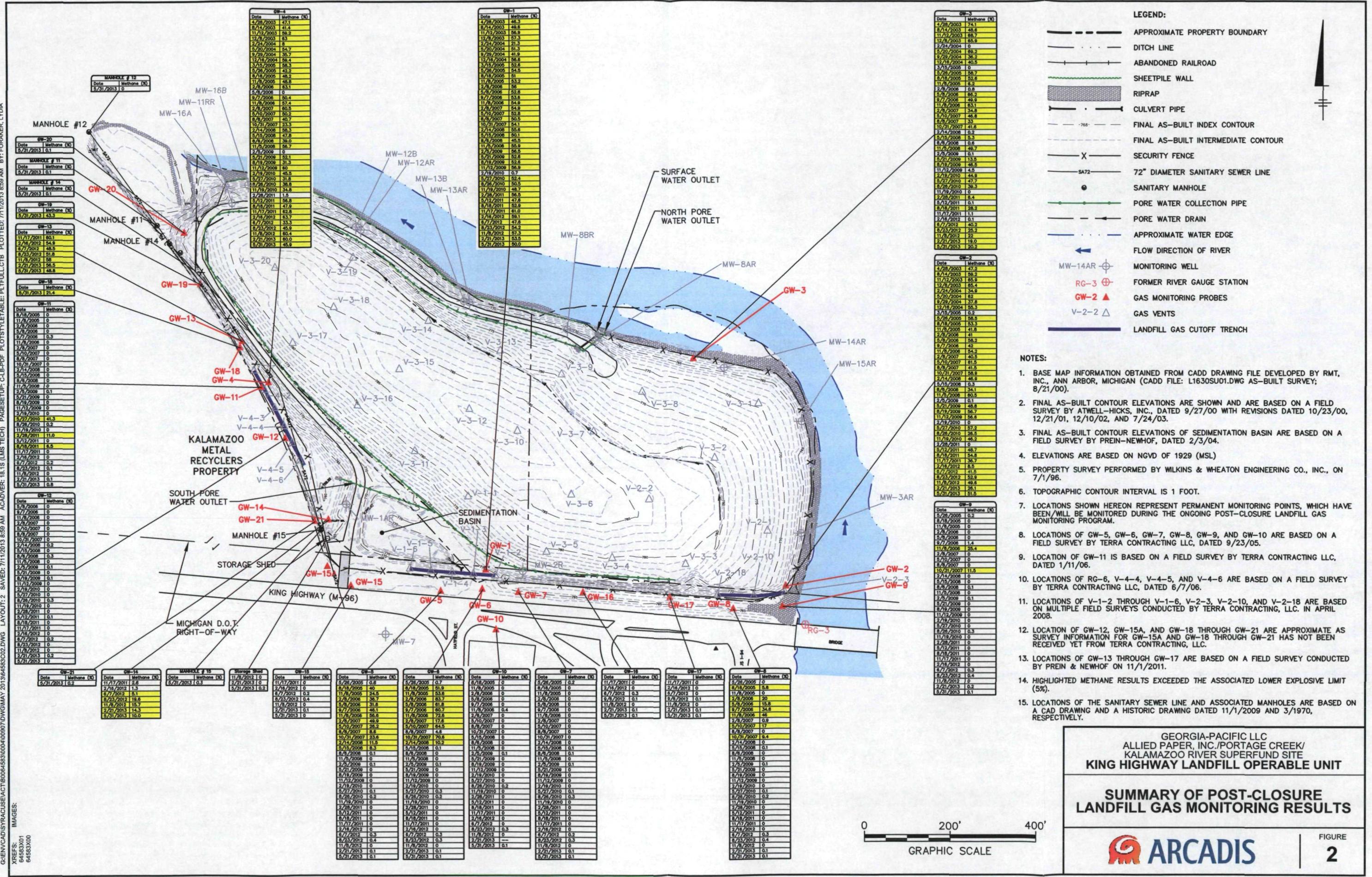
Notes:

1. Landfill gas monitoring results provided by CTI and Associates, Inc. using a GEM™ 2000 portable gas analyzer from April 27, 2003 to May 21, 2004.
2. Landfill gas monitoring results provided by Golder Associates, Inc. using a GEM™ 500 portable gas analyzer from September 29, 2004 to May 8, 2006, November 8, 2006, May 10, 2007, and August 6, 2008.
3. Landfill gas monitoring results provided by Golder Associates, Inc. using a GEM™ 2000 portable gas analyzer on September 7, 2006, February 8, 2007, August 8, 2007, October 31, 2007, May 15, 2008, November 5, 2008, February 5, 2009, May 21, 2009, August 19, 2009, and November 12, 2009.
4. Landfill gas monitoring results provided by ARCADIS using a GEM™ 500 portable gas analyzer on February 19, 2010, May 27, 2010, August 26, 2010, November 19, 2010, February 28, 2011, May 12, 2011, August 18, 2011, November 17, 2011, February 16, 2012, June 7, 2012, August 23, 2012, September 6, 2012, November 8, 2012, February 21, 2013, and May 21, 2013.
5. Landfill gas monitoring results provided by ARCADIS using a GEM™ 2000 portable gas analyzer on February 16, 2012.
6. On February 8, 2006, three other borings were attempted at the location of BH-201, but the boreholes were too wet to provide an accurate reading.
7. The water level at the location of the borehole was too high to provide an accurate reading.
8. On February 8, 2007, methane concentrations were detected above the lower explosive limit at GW-3; however, temporary boreholes were not installed to delineate the extent of the methane due to a health and safety risk created by snow covered rocks along the river.
9. On February 8, 2007, the valve on GW-6 was frozen and the cap could not be removed. The concentrations presented for GW-6 were obtained from a temporary borehole, which was installed directly next to well.
10. An additional temporary borehole(s) was not installed west of permanent gas probe GW-11 to delineate the extent of methane concentrations above the LEL toward the adjacent Kalamazoo Metal Recyclers, Inc. property due to the amount of debris located underneath the ground surface along the western property line of the KHL OU.
11. Due to rapid fluctuations in the gas concentration readings on the portable gas analyzer, the concentrations for all parameters (i.e., CH₄, O₂, and CO₂) could not be determined from the same reading, producing a balance nitrogen concentration for GW-1 and GW-13 less than zero.
12. As verbally directed by MDEQ in the field, permanent gas probe GW-10 was not monitored due to low readings in GW-5, GW-6, and GW-7.
13. CH₄ = Methane.
14. CO₂ = Carbon Dioxide.
15. O₂ = Oxygen.
16. GW = Permanent gas monitoring probe.
17. BH = Temporary borehole.
18. V = Permanent gas vent.
19. -- = gas vent was not monitored.



Figures







Attachment A

DAILY LOG

Project No. B0064583.0004.00907 Page 1 of 1
 Site Location: Kalamazoo, Michigan
 Prepared By: Christine Snyder

Date	Time	Description of Activities
5/22/2013		ARCADIS: C. Snyder
		CDM: Andrew Santini
		GP: Garry Griffith
		Terra: Bill Dennis; Rich Anson
		Weather: high of 74°, chance of thunderstorms
	700	Terra, CDM and ARCADIS onsite. Discuss scope of work and health and safety items.
	745	Set up equipment to hydrovac at GW-21.
		VOCs measured in nearby manhole is 11.7. No LEL reading.
	920	Found sanitary sewer line at 6.2 feet below ground surface. Move over to the west to make the hole larger in order to see the edge of the pipe.
	1030	Set up hydrovac at GW-18. Note: Found small concrete fragments throughout the hole and a small residual clay layer.
	1330	Move to GW-19.
	1450	Stop work due to thunder and lightning.
	1520	Resume work.
	1900	Encounter refusal at 13 feet below ground surface at GW-19. Proposed depth to water was 14 feet below ground surface, but the gas probe would be installed 1 foot above water.
		Checked top of the invert pipe at the closest sanitary sewer manhole (approximately 20 feet, but will double check with GPS tomorrow). Terra cannot move west due to boom on hydrovac truck not long enough.
	2020	Set casing in GW-21 (7 feet), GW-18 (11 feet), and GW-19 (13 feet).
	2035	ARCADIS, GP, CDM offsite.
5/23/2013		ARCADIS: C. Snyder
		CDM: Andrew Santini
		MDEQ: Keith Krawczyk
		GP: Garry Griffith
		Terra: Bill Dennis; Brett Lemon
		Weather: Cloudy, high of 60°
	700	ARCADIS, CDM, and Terra onsite. Go through health and safety items.
	807	West Michigan Drilling onsite. Walk through boring/gas probe locations with drillers.
	830	Set GW-21. See construction log. Depth to water approximately 5 feet 11 inches. Note: Set GW-21 partially in water due to high water elevations.
	1030	Set GW-18. See construction log. Depth to water approximately 9.8 feet.
	1215	Hit refusal at GW-15A proposed location. Refusal was found with hand auger. Need to confirm new location with Garry Griffith.
	1230	Break for lunch.
	1315	Return from lunch. Start construction for GW-19.
	1415	Set GW-19 at 14.5 feet below ground surface. Depth to water approximately 15.5 feet. P-stone from 14.5 to 15.5 feet below ground surface.
	1530	Set GW-20 at 3 feet to 9.5 feet screen. P-stone at 9.5 feet to 10.3 feet.
	1600	Concrete truck onsite to put in concrete pads.
		Note: Talked with Garry Griffith and Keith Krawczyk. They were okay with stepping out a few feet from proposed location for GW-15A.
	1815	ARCADIS, Terra, WMD, and GP offsite.

SOIL BORING LOG

Boring No.: <u>GW-15A</u>							Sheet: 1 of 5	
Project Name: <u>KHL OU</u>			Date Started: <u>5/23/2013</u>		Logger: <u>Christine Snyder</u>			
Project Number: <u>B0064583.0004.00907</u>			Date Completed: <u>5/23/2013</u>		Editor:			
Project Location: <u>Kalamazoo, Michigan</u>			Weather Conditions:					
Depth (feet)	Blow Counts	Sample ID & Time	Recovery (in.)	PID (ppm)	USCS Class.	Description		Construction Details
2						0 - 5 - Sand, very fine to very coarse, little silt, trace to little small to large pebbles, sub-angular, poorly sorted, dry, yellowish brown. Note: Color change to dark brown at 1.5 feet below ground surface. Residuals at 2.5 feet below ground surface.		
4						5 - 6 - Sand, very fine to very coarse, trace silt, trace granular to large pebbles, sub-angular, poorly sorted, dry, dark yellowish brown. Note: Trace slag at 5 feet below ground surface.		
6						6 - 7 - Sand, medium to coarse, trace very coarse to granular, sub-angular, poorly sorted, moist, yellowish brown.		
8						7 - 10 - Sand, fine to coarse, little granular to small pebbles, sub-angular, poorly sorted, moist, very dark gray. Note: Trace slag. Paper residuals at 8 to 9 feet below ground surface.		
10						ground surface. Wet at 10 feet below ground surface.		
						End of boring at 10 feet below ground surface.		
12								
14								
16								
18								
20								
22								
Drilling Co.: <u>West Michigan Drilling</u>				Sampling Method: <u>Hand auger</u>				
Driller: _____				Sampling Interval: _____				
Drilling Method: <u>Hand auger</u>				Water Level Start: _____				
Drilling Fluid: <u>None</u>				Water Level Finish: _____				
Remarks: _____				Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
				Surface Elev.: _____				
				North Coord.: _____				
				South Coord.: _____				

SOIL BORING LOG

Boring No.: <u>GW-18</u>							Sheet: 2 of 5	
Project Name: <u>KHL OU</u>			Date Started: <u>5/22/2013</u>		Logger: <u>Christine Snyder</u>			
Project Number: <u>B0064583.0004.00907</u>			Date Completed: <u>5/23/2013</u>		Editor: _____			
Project Location: <u>Kalamazoo, Michigan</u>			Weather Conditions: _____					
Depth (feet)	Blow Counts	Sample ID & Time	Recovery (in.)	PID (ppm)	USCS Class.	Description		Construction Details
2						0 - 11 - Sand, little silt, very fine to very coarse, trace small to large pebbles, poorly sorted, dry, brown. Note: Concrete fragments.		
4								
6								
8						7.5 - 8.5 - clay, gray, residual material.		
10						Note: wet at 11 feet below ground surface.		
12								
14								
16								
18								
20								
22								
Drilling Co.: <u>Terra Contracting Services, LLC</u>				Sampling Method: <u>NA</u>				
Driller: _____				Sampling Interval: <u>NA</u>				
Drilling Method: <u>Hydrovac</u>				Water Level Start: _____				
Drilling Fluid: <u>NA</u>				Water Level Finish: _____				
Remarks: <u>Lithology is estimated</u>				Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
				Surface Elev.: _____				
				North Coord.: _____				
				South Coord.: _____				

SOIL BORING LOG

Boring No.: <u>GW-19</u>							Sheet: 3 of 5	
Project Name: <u>KHL OU</u>			Date Started: <u>5/22/2013</u>		Logger: <u>Christine Snyder</u>			
Project Number: <u>B0064583.0004.00907</u>			Date Completed: <u>5/23/2013</u>		Editor:			
Project Location: <u>Kalamazoo, Michigan</u>			Weather Conditions:					
Depth (feet)	Blow Counts	Sample ID & Time	Recovery (in.)	PID (ppm)	USCS Class.	Description		Construction Details
0						0 - 12.5 - Sand, very fine to very coarse, poorly sorted, trace cobbles, sub-angular, dry, brown. Note: Concrete fragments intermittently.		
2								
4								
6								
8								
10								
12						12.5 - 15 - Clay and silt, moist, no dilatancy, low plasticity, soft, black.		
14								
16						15 - 15.5 - Sand, very fine, silt, rapid dilatancy, moist, well sorted, very dark gray, greenish. Note: Wet at 15.5 feet below ground surface.		
18								
20								
22								
Drilling Co.: <u>Terra/West Michigan Drilling</u>					Sampling Method: <u>Hand auger</u>			
Driller: _____					Sampling Interval: _____			
Drilling Method: <u>Hydrovac/hand auger</u>					Water Level Start: _____			
Drilling Fluid: _____					Water Level Finish: _____			
Remarks: <u>Hydrovac from 0 to 12.5 feet below.</u> <u>Hand auger from 12.5 to 15.5 feet below ground surface.</u>					Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Lithology estimated from 0 to 12.5 feet below ground surface.					Surface Elev.: _____			
					North Coord.: _____			
					South Coord.: _____			

SOIL BORING LOG

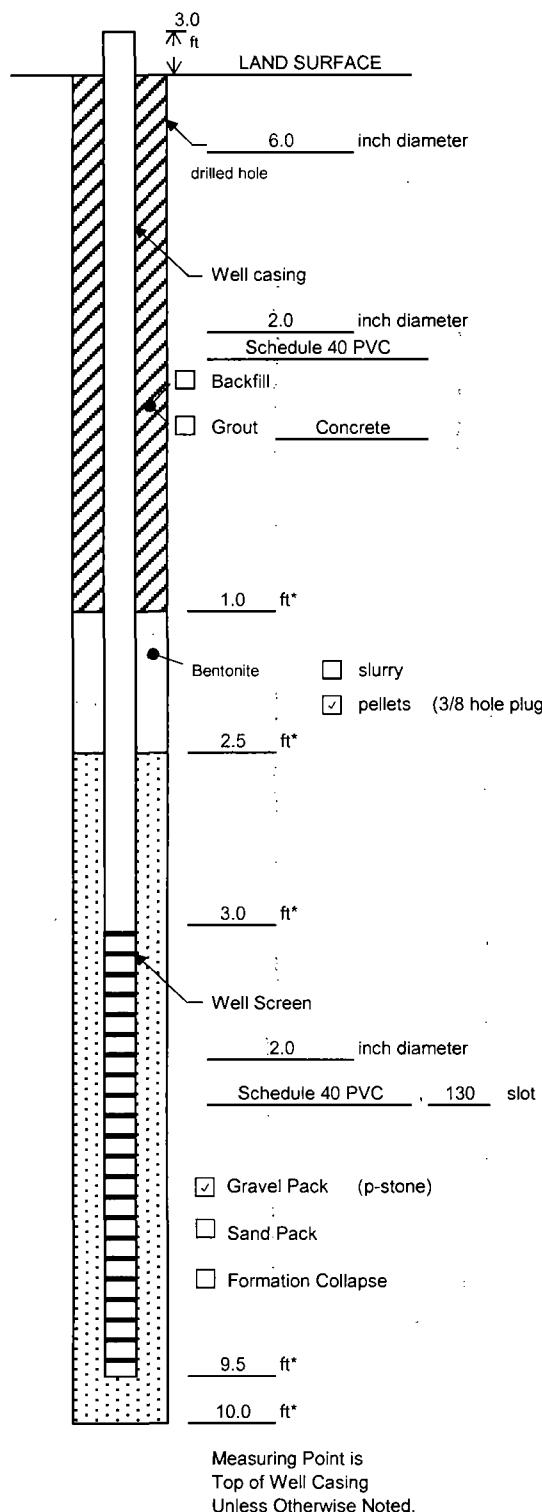
Boring No.: <u>GW-20</u>							Sheet: 4 of 5
Project Name: <u>KHL OU</u>			Date Started: <u>5/23/2013</u>		Logger: <u>Christine Snyder</u>		
Project Number: <u>B0064583.0004.00907</u>			Date Completed: <u>5/23/2013</u>		Editor:		
Project Location: <u>Kalamazoo, Michigan</u>			Weather Conditions: <u>Rain</u>				
Depth (feet)	Blow Counts	Sample ID & Time	Recovery (in.)	PID (ppm)	USCS Class.	Description	Construction Details
0						0 - 2 - Sand, very fine to coarse, trace small to large pebbles, sub-round, poorly sorted, dark brown, dry.	
2						2 - 5.5 - Sand, very fine to medium, trace small to medium pebbles, sub-round to sub-angular, poorly sorted, dry, yellowish brown.	
4						5.5 - 9.5 - Sand, very fine to coarse, trace small to large pebbles, sub-round to sub-angular, poorly sorted, dry, dark brown. Note: Trace residual paper.	
6						9.5 - 10.3 - Sand, some silt, very fine to fine, moist, very dark. Note: Wet, rapid dilatancy at 10 feet below ground	
8						surface.	
10							
12							
14							
16							
18							
20							
22							
Drilling Co.:	<u>West Michigan Drilling</u>			Sampling Method: _____			
Driller:				Sampling Interval: _____			
Drilling Method:	<u>Hand auger</u>			Water Level Start: _____			
Drilling Fluid:	<u>NA</u>			Water Level Finish: _____			
Remarks:				Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
				Surface Elev.: _____			
				North Coord.: _____			
				South Coord.: _____			

SOIL BORING LOG

Boring No.: <u>GW-21</u>							Sheet: 5 of 5
Project Name: <u>KHL OU</u>			Date Started: <u>5/22/2013</u>		Logger: <u>Christine Snyder</u>		
Project Number: <u>B0064583.0004.00907</u>			Date Completed: <u>5/23/2013</u>		Editor: _____		
Project Location: <u>Kalamazoo, Michigan</u>			Weather Conditions: _____				
Depth (feet)	Blow Counts	Sample ID & Time	Recovery (in.)	PID (ppm)	USCS Class.	Description	Construction Details
2						0 - 7 - Sand, very fine to very coarse, little silt, poorly sorted, brown. Note: Some roots at 0 to 2 feet below ground surface.	
4							
6						Note: Wet at 5.5 feet below ground surface.	
8						Note: Found the top of the sanitary sewer line at 6.3 feet below ground surface.	
10							
12						12.5 - 15 - Clay and silt, moist, no dilatancy, low plasticity, soft, black.	
14							
16						15 - 15.5 - Sand, very fine, silt, rapid dilatancy, moist, well sorted, very dark gray, greenish. Note: Wet at 15.5 feet below ground surface.	
18							
20							
22							
Drilling Co.: <u>Terra Contracting Services, LLC</u>				Sampling Method: <u>NA</u>			
Driller: _____				Sampling Interval: _____			
Drilling Method: <u>Hydrovac</u>				Water Level Start: _____			
Drilling Fluid: <u>NA</u>				Water Level Finish: _____			
Remarks: <u>Borehole lithology estimated.</u>				Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
				Surface Elev.: _____			
				North Coord.: _____			
				South Coord.: _____			

WELL CONSTRUCTION LOG

(Unconsolidated)

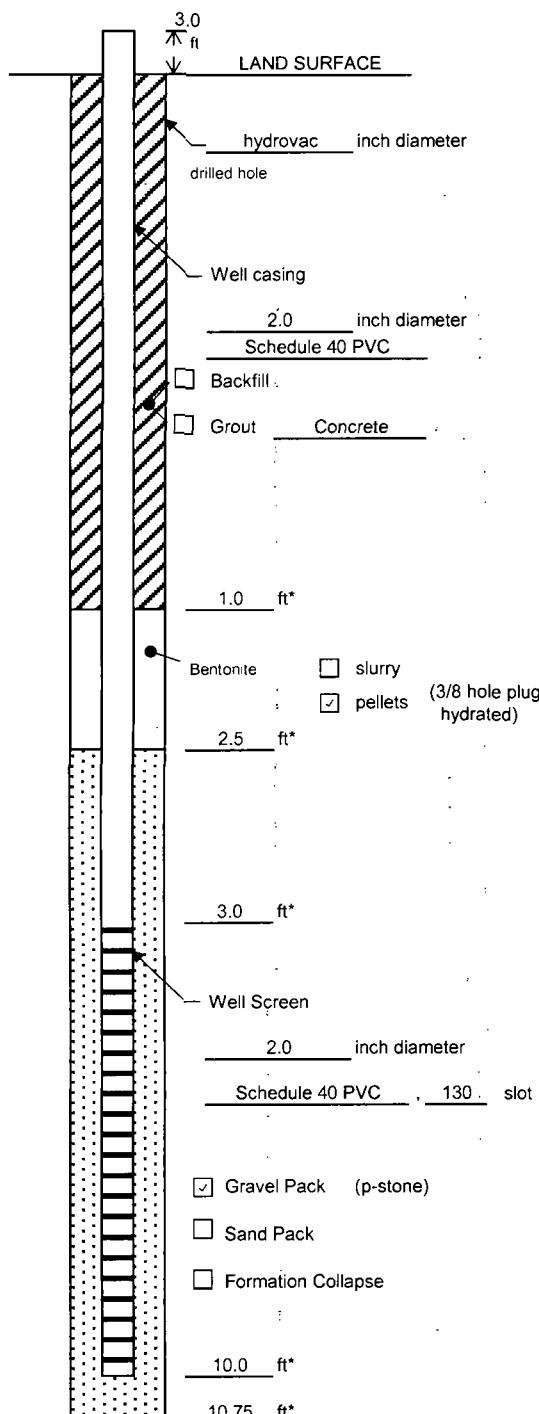


* Depth Below Land Surface

Project	KHL OU	Well	GW-15A
Town/City	Kalamazoo		
County	Kalamazoo	State	Michigan
Permit No.			
Land-Surface Elevation Datum:			
			feet
			<input type="checkbox"/> Surveyed
			<input type="checkbox"/> Estimated
Installation Date(s)	5/23/2013		
Drilling Method	Hand auger		
Drilling Contractor	West Michigan Drilling		
Drilling Fluid	None		
Development Technique(s) and Date(s)			
			NA
Fluid Loss During Drilling	NA	none	gallons
Water Removed During Development	NA	gallons	
Static Depth to Water	NA	feet below M.P.	
Pumping Depth to Water	NA	feet below M.P.	
Pumping Duration	NA	hours	
Yield	NA	gpm	Date NA
Specific Capacity	NA	gpm/ft	
Well Purpose	Gas probe		
Remarks			
Prepared by	Christine Snyder		

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project KHL OU Well GW-18
 Town/City Kalamazoo
 County Kalamazoo State Michigan
 Permit No. _____

Land-Surface Elevation Datum:

feet Surveyed
 Estimated

Installation Date(s) 5/22/2013 - 5/23/2013

Drilling Method Hydrovac

Drilling Contractor Terra Contracting Services, LLC/West Michigan Drilling

Drilling Fluid None

Development Technique(s) and Date(s)

NA

Fluid Loss During Drilling NA none gallons

Water Removed During Development NA gallons

Static Depth to Water NA feet below M.P.

Pumping Depth to Water NA feet below M.P.

Pumping Duration NA hours

Yield NA gpm Date NA

Specific Capacity NA gpm/ft

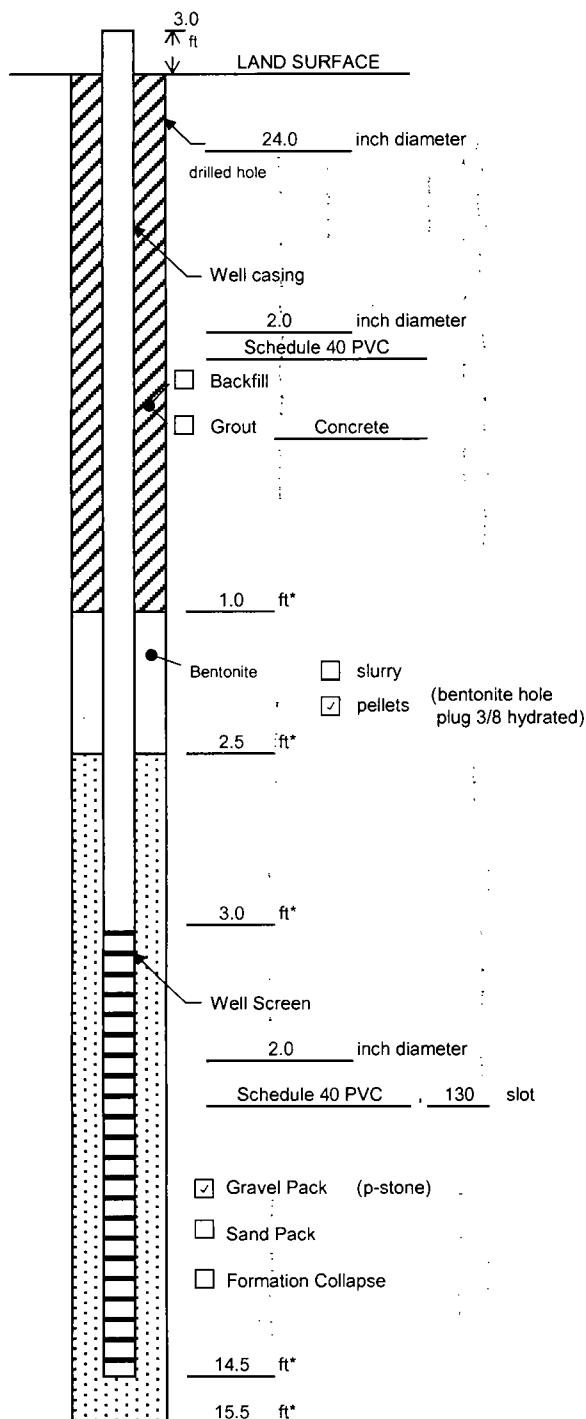
Well Purpose Gas probe

Remarks _____

Prepared by Christine Snyder

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

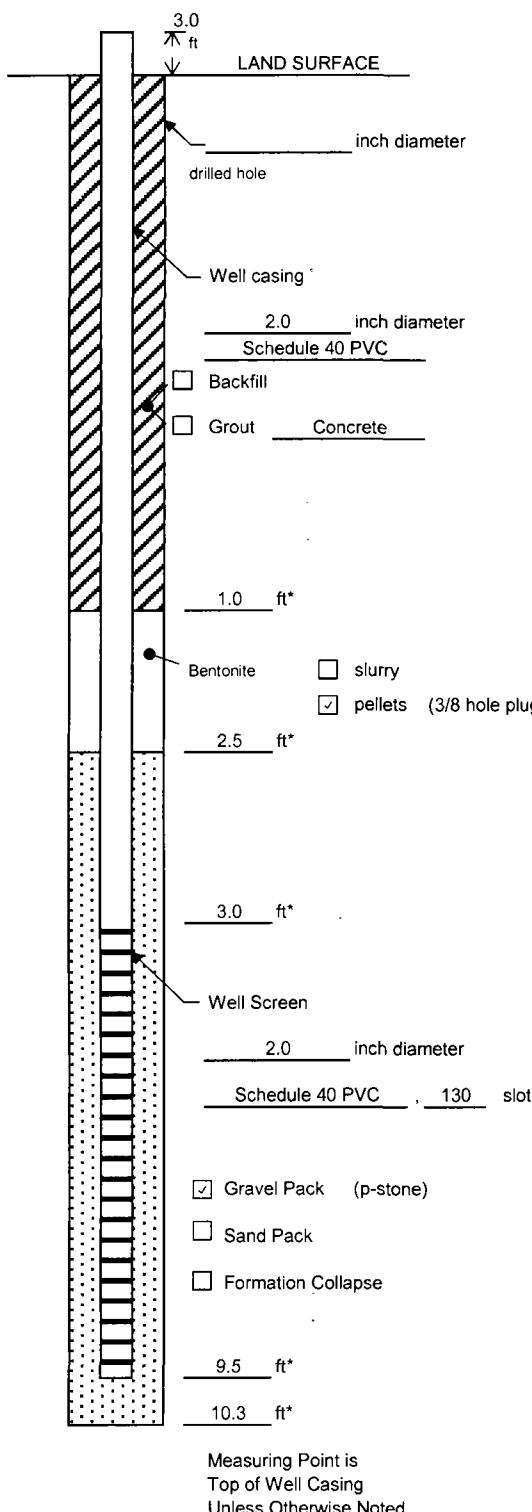
* Depth Below Land Surface

Project	KHL OU	Well	GW-19
Town/City	Kalamazoo		
County	Kalamazoo	State	Michigan
Permit No.			
Land-Surface Elevation Datum:			
			feet
			<input type="checkbox"/> Surveyed
			<input type="checkbox"/> Estimated
Installation Date(s)	5/22/2013 - 5/23/2013		
Drilling Method	Hydrovac/hand auger		
Drilling Contractor	Terra Contracting Services, LLC/West Michigan Drilling		
Drilling Fluid	None		
Development Technique(s) and Date(s)			
			NA
Fluid Loss During Drilling			
			none gallons
Water Removed During Development			
			NA gallons
Static Depth to Water	NA feet below M.P.		
Pumping Depth to Water	NA feet below M.P.		
Pumping Duration	NA hours		
Yield	NA gpm	Date	NA
Specific Capacity	NA gpm/ft		
Well Purpose	Gas probe		
Remarks			

Prepared by Christine Snyder

WELL CONSTRUCTION LOG

(Unconsolidated)



* Depth Below Land Surface

Project KHL OU Well GW-20
 Town/City Kalamazoo
 County Kalamazoo State Michigan
 Permit No. _____

Land-Surface Elevation Datum:

feet Surveyed
 Estimated

Installation Date(s) 5/23/2013

Drilling Method Hand auger

Drilling Contractor West Michigan Drilling

Drilling Fluid None

Development Technique(s) and Date(s)

NA

Fluid Loss During Drilling NA none gallons

Water Removed During Development NA gallons

Static Depth to Water NA feet below M.P.

Pumping Depth to Water NA feet below M.P.

Pumping Duration NA hours

Yield NA gpm Date NA

Specific Capacity NA gpm/ft

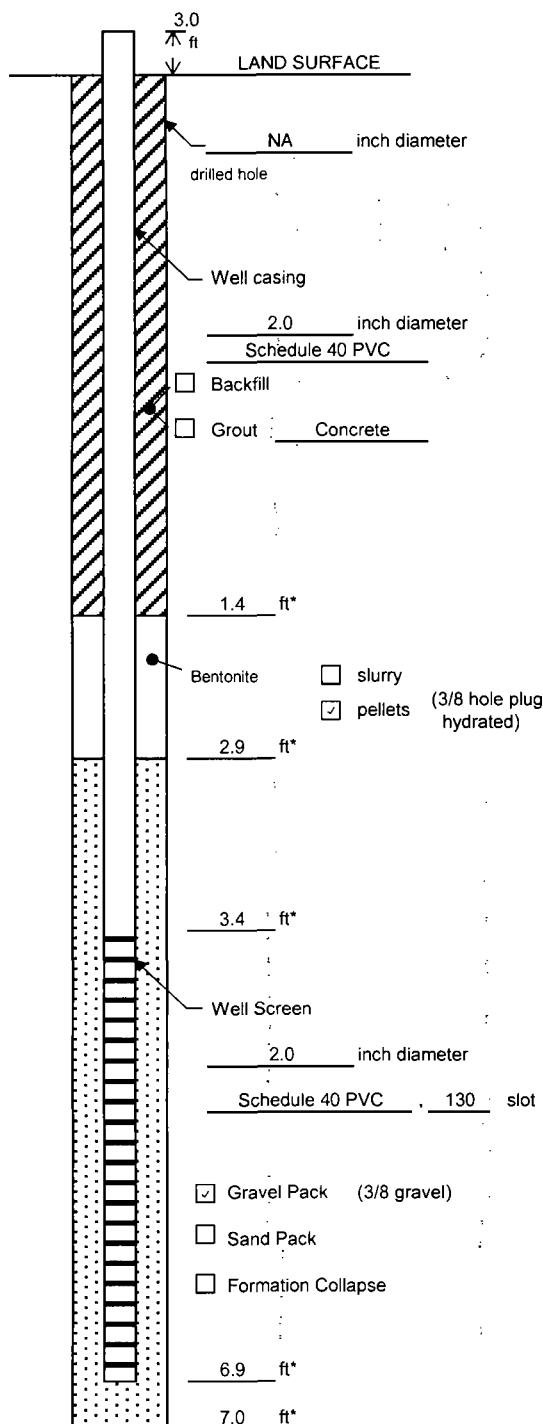
Well Purpose Gas probe

Remarks _____

Prepared by Christine Snyder

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project KHL OU Well GW-21

Town/City Kalamazoo

County Kalamazoo State Michigan

Permit No. _____

Land-Surface Elevation Datum:

feet Surveyed Estimated

Installation Date(s) 5/22/2013 - 5/23/2013

Drilling Method Hydrovac - 2' x 3' hole excavated

Drilling Contractor Terra Contracting Services, LLC/West Michigan Drilling

Drilling Fluid None

Development Technique(s) and Date(s)

NA

Fluid Loss During Drilling NA none gallons

Water Removed During Development NA gallons

Static Depth to Water NA feet below M.P.

Pumping Depth to Water NA feet below M.P.

Pumping Duration NA hours

Yield NA gpm Date NA

Specific Capacity NA gpm/ft

Well Purpose Gas probe

Remarks The hole excavated during hydro excavation was larger than 8½".

The gas probe was installed in the side of the excavation away from the sanitary sewer line. The excavation was backfilled with gravel.

Prepared by Christine Snyder

Real Time Exposure Monitoring Data Collection Form

Document all air monitoring conducted on the Site below. Keep this form with the project file.

Site Name: KHL OU Date: 5/22/2013
 Instrument: 4 gas plus Model: MiniRAE plus Serial #: _____

Calibration Method: (Material used settings, etc.)	4 gas mixture - CO, CH ₄ , H ₂ S, O ₂ , N ₂ with Teollar Bags, Isobutylene
Calibration Results:	VOC = 100 LEL = 49 H ₂ S = 25 O = 20.9 CO = 50
Calibrated By:	Christine Snyder

Activity Being Monitored	Compounds/Hazards Monitored	Time	Reading	Action Required? Y/N
Hydrovac at GW-21	LEL, CO, H ₂ S, O ₂ , N ₂ , VOC	1015	LEL = 0	N
Sanitary manhole*	LEL, CO, H ₂ S, O ₂ , N ₂ , VOC		LEL = 0	N

Describe Any Actions Taken as a Result of this Air Monitoring and Why (does it match Table 5-1):

4 gas mixture CH₄ = 2.5% vol (50% LEL)

* Lifted manhole to see if we could find any LEL with 4-gas. Did not work in sewer.

PHOTO LOG



Photo No. 1: Photo shows the location of gas probe GW-21 to be installed.



Photo No. 2: Photo shows the hydrovac hose in gas probe GW-21 upon contacting sanitary line at 6.3 feet below ground surface.

PHOTO LOG



Photo No. 3: Photo shows water in borehole for new gas probe GW-21 above the sanitary sewer line.



Photo No. 4: Photo shows the expanded borehole size at the location for new gas probe GW-21 to confirm the location of the sanitary sewer line.

PHOTO LOG



Photo No. 5: Photo shows the casing for new gas probe GW-21, which was set overnight to prevent collapsing of the borehole.



Photo No. 6: Photo shows the setting of new gas probe GW-21.

Photo No. 7: Photo shows an example of the caps that were placed on new gas probes GW-15A and GW-18 through GW-21 at the KHL.

